DOCUMENT RESUME

ED 474 599 TM 034 796

AUTHOR	Hoyt, Cathy
TITLE	Mathematics: Algebra and Geometry. GED Scoreboost.
ISBN	ISBN-0-9717167-2-2
PUB DATE	2002-00-00
NOTE	49p.; Produced by New Readers Press. For other "Scoreboost" workbooks for preparing for the GED Mathematics test, see TM 034 799 ("Mathematics: Measurement and Data Analysis") and TM 034 900 ("Mathematics; Whole Numbers, Decimals, Fractions, and Percents.").
AVAILABLE FROM	New Readers Press, 1320 Jamesville Avenue, Syracuse, NY 13210. Tel: 800-448-8878 (Toll Free). Web site: http://www.newreaderspress.com.
PUB TYPE	Guides - Non-Classroom (055)
EDRS PRICE	EDRS Price MF01 Plus Postage. PC Not Available from EDRS
DESCRIPTORS	*Algebra; *Equivalency Tests; *Geometry; High School Equivalency Programs; *Mathematics Tests; Problem Solving; *Skill Development
IDENTIFIERS	*General Educational Development Tests

ABSTRACT

GED "Scoreboost" materials target exactly the skills one needs to pass the General Educational Development (GED) tests. This book focuses on the GED Mathematics test. To prepare for the test, the test taker needs to learn skills in number and operation sense, data and statistics, geometry and measurement, and algebra. To pass the test, the test taker needs to develop skills in calculator use, problem solving, and grids (for recording answers). The test taker can practice the 14 strategies in this book, apply them to 3 GED practice activities, and then take the practice GED test at the end of the book. The strategies are: (1) use tables to solve algebra word problems; (2) use the calculator to solve algebra problems; (3) work backwards to solve problems; (4) set up expressions, equations, and functions; (5) explore angle relationships; (6) use the formulas page with geometry problems; (7) use the calculator with the formulas page; (8) solve set-up problems in geometry; (9) use the Pythagorean relationship; (10) use proportion with similar figures; (11) plot points on coordinate grids; (12) find points on a line; (13) find slope on a coordinate grid; and (14) fins the distance between points. (SLD)

Reproductions supplied by EDRS are the best that can be made
from the original document.

ED 474 599

TM
TMTR 0101

GED Scoreboost™

MATHEMATICS
Algebra and Geometry

PERMISSION TO REPRODUCE AND DISSEMINATE THIS MATERIAL IN MICROFICHE ONLY HAS BEEN GRANTED BY

C. Van Slyke

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

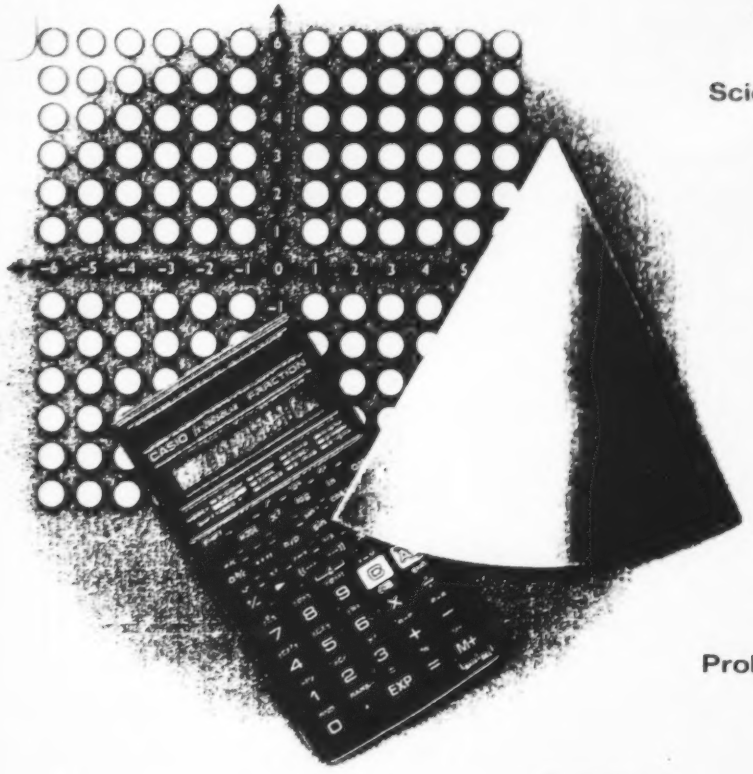
2B

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

√ This document has been reproduced as received from the person or organization originating it.

□ Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.



Scientific Calculator, Grids, and Problem-Solving Strategies

TM034796

BEST COPY AVAILABLE

New Readers Press

Contents

Strategy 1 • Use Tables to Solve Algebra Word Problems 2
Strategy 2 • Use the Calculator to Solve Algebra Problems 4
Strategy 3 • Work Backwards to Solve Problems 6
Strategy 4 • Set Up Expressions, Equations, and Functions 8

GED Practice 1: Algebra Word Problems 10

Strategy 5 • Explore Angle Relationships 12
Strategy 6 • Use the Formulas Page with Geometry Problems 14
Strategy 7 • Use the Calculator with the Formulas Page 16
Strategy 8 • Solve Set-up Problems in Geometry 18
Strategy 9 • Use the Pythagorean Relationship 20
Strategy 10 • Use Proportion with Similar Figures 22

GED Practice 2: Angles, Formulas, and Similar Figures 24

Strategy 11 • Plot Points on Coordinate Grids 26
Strategy 12 • Find Points on a Line 28
Strategy 13 • Find Slope on a Coordinate Grid 30
Strategy 14 • Find the Distance Between Points 32

GED Practice 3: Slope, Distance, and Coordinate Grids 34

Practice GED Test 36

Answer Key 40

Copyright © 2002 by Trian Publishing Company
TrianPublishing@aol.com

Casio *fx*-260 image courtesy of Casio, Inc.

Distributed by:
New Readers Press
U.S. Publishing Division of Laubach Literacy International
1320 Jamesville, Syracuse, N.Y. 13210

All rights reserved. No part of this book may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording, or by any information storage and retrieval system

GED Scoreboost™ Mathematics Team
Project Developer: Caren Van Slyke
Writer: Cathy Hoyt
Editor: Kathy Osmus
Copy Editor: Karen Schenkenfelder
Associate Editor: Mark Ondrla
Production Manager: Jean Farley Brown
Cover Design: Karen Blanchard

Manufactured in the United States of America
10 9 8 7 6 5 4 3 2
ISBN 0-9717167-2-2

The GED Scoreboost™ Advantage

GED Scoreboost materials target the skills that you need to pass the GED. To develop this program, we have built on decades of experience in teaching GED classes and preparing materials for hundreds of thousands of students who have passed the GED. We have studied the GED Tests thoroughly and have designed materials that will help you to succeed on the tests.

To prepare for the GED Mathematics Test, you will need to learn skills in number and operation sense, data and statistics, geometry and measurement, and algebra. However, to pass the test, you will need to develop skills in these key areas:

- **Calculator Skills**—You will be given a Casio *fx*-260 solar scientific calculator at the GED Testing Center. You may use it on Part I, which is half of the GED Math Test.

  You shouldn't wait until the day of the test to learn to use this calculator. It is more complicated than a regular calculator, and you need to make sure that you know how to use it effectively. Check with local office supply businesses or discount stores to find where you can buy a Casio *fx*-260. Buy one for yourself, work with it as you learn the *GED Scoreboost* strategies, and use it when you go shopping or pay your bills. If you do this, working with it on the GED Math Test will be a snap.

- **Problem Solving**—The GED Math Test is made up mostly of word problems and graphics. To pass the GED, you need to be skilled at solving these types of problems.

  No one learns to be a good problem solver overnight. To prepare for the GED Math Test, you need to practice with the types of problems that you will see on the test and to learn strategies for solving them. The *Math Scoreboost* books are based on proven problem-solving strategies.

- **Grids**—Forty out of fifty questions on the GED Math Test will be multiple-choice. The other ten problems are an alternate format that require you to solve them and then record your answer on a grid.

  GED Mathematics Scoreboost will give you lots of practice filling in both of the types of grids that you will see on the test.

This is the ***GED Scoreboost Advantage:*** Practice the fourteen strategies in this book, apply them to the three *GED Practice* activities, and then take the *Practice GED Test* at the end of this book.

You can also use these other books to prepare for the GED Math Test:
GED Mathematics Scoreboost: Whole Numbers, Decimals, Fractions, and Percents
GED Mathematics Scoreboost: Measurement and Data Analysis

To get more information about these and other *GED Scoreboost* titles, see the back of this book.

Good luck!
The GED Scoreboost Team

STRATEGY 1 Use Tables to Solve Algebra Word Problems

On the GED Math Test, an algebra word problem describes a situation in which you solve for an **unknown.** The unknown quantity is usually represented with a letter, such as x or n. Constructing a **table** can help you to organize your thinking and to write an equation to represent the situation.

EXAMPLE: John is six times as old as his little sister Anna. In twelve years, John will be twice as old as Anna. How old is John now?

THINK: I will create a table to make it easier to write an equation.

	Anna's Age	John's Age
Now	x	$6x$
In 12 years	$x + 12$	$6x + 12$

Step 1: Let x represent Anna's age now. John is six times as old as Anna now, so let $6x$ represent John's age now. Add 12 to their current ages to express their ages in twelve years.

Step 2: Write an equation to represent the relationship between their ages in 12 years. In twelve years, John's age will be twice Anna's age, so the expression for John's age in twelve years equals twice the expression for Anna's age in twelve years. Solve for x.

$$\begin{aligned} 6x + 12 &= 2(x + 12) \\ 6x + 12 &= 2x + 24 \\ 4x &= 12 \\ x &= 3 \end{aligned}$$

Step 3: Now that you know the value of x, reread the problem to see what the question is asking. The problem asks you to find John's age now. Since Anna's age now is 3, John's age now is $6x = 6(3) = 18$.

SOLUTION: John is **18 years old** now.

GED Problem

A cashier has 90 dimes and nickels in his cash drawer. If the total value of the coins is $6.40, how many nickels are in the drawer?

(1) 26
(2) 38
(3) 52
(4) 63
(5) 72

THINK: I will make a table to organize the information.

Step 1: Let x = the number of nickels and $90 - x$ = the number of dimes. To work in whole numbers, express all of the values in cents.

	Nickels	Dimes
Number	x	$90 - x$
Value in cents	$5x$	$10(90 - x)$

Step 2: The total value of both types of coins equals $6.40 or 640 cents. Write and solve the equation.

$$\begin{aligned} 5x + 10(90 - x) &= 640 \\ 5x + 900 - 10x &= 640 \\ -5x &= -260 \\ 5x &= 260 \\ x &= 52 \end{aligned}$$

ANSWER: (3) 52

TESTWISE ① ② ③ ④ ⑤

As the example above shows, when you solve for x, you have not necessarily finished your work. Reread each problem to identify what the question is asking and finish the solution, if necessary.

Apply the Strategy

Directions: Solve the problems below. For problems 1–3, first complete the table. For problems 4–6, you may make your own table.

1. Carrie is three times as old as David. In five years, Carrie will be only twice as old as David. How old will Carrie be in five years?

   (1) 30
   (2) 20
   (3) 15
   (4) 10
   (5) 5

	David's Age	Carrie's Age
Now	x	
In 5 years		

Answer: _____

2. The sum of four consecutive numbers is 230. What is the largest of these numbers? (*Hint:* Consecutive numbers are numbers in counting order; for example, 1, 2, 3.)

   (1) 56
   (2) 57
   (3) 59
   (4) 61
   (5) 115

1st Number	2nd Number	3rd Number	4th Number
x	$x + 1$		

Answer: _____

3. Donna earns twice as much money per month as Omar. Omar earns $200 more than Alex. Together, the three workers earn $3320 per month. How much does Omar earn per month?

   (1) $640
   (2) $680
   (3) $840
   (4) $880
   (5) $1760

Alex	Omar	Donna
x		

Answer: _____

4. A theater sold 300 tickets to a special benefit performance. The ticket prices were $4 for children and $6 for adults. If three times as many adults attended as children, how many adults attended?

   (1) 33
   (2) 75
   (3) 125
   (4) 225
   (5) Not enough information is given.

5. Ryan drove 380 miles in 6 hours. He drove at an average rate of 70 miles per hour for the first part of the trip. He averaged 60 miles an hour for the second part. For how many hours did he average 70 miles per hour? (*Hint:* Remember, rate in miles per hour times the time in hours = distance traveled.)

   (1) 1
   (2) 2
   (3) 3
   (4) 4
   (5) 5

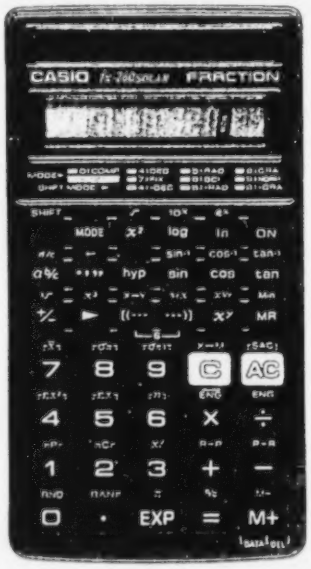
6. Panita, Bill, and Evan are friends. Panita is six years older than Bill. Evan's age is twice Panita's age. If the sum of their ages is 74, how old is Panita?

   (1) 14
   (2) 20
   (3) 28
   (4) 34
   (5) 40

Answers start on page 40.

STRATEGY 2 Use the Calculator to Solve Algebra Problems

An algebraic expression is a series of operations written with numbers, operation signs, and variables. A **variable** is a letter, or symbol, that can represent different values. If you are given the values for the variables, you can **evaluate,** or find the value of, the expression. On Part I of the GED Math Test, you will be given a Casio *fx*-260 calculator. These calculator keys will be helpful with algebraic expressions:



- To enter a **negative number,** enter the number and then press the **change sign** key [+/−].
- Use [(---] and [---)] to enclose operations in **grouping symbols.**
- To **square** a number, enter the number and then press [x^2].
- To raise a number to some other **power,** enter the number, press [x^y], and then enter the power.
- To find the **square root** of a number, enter the number and press [Shift] [x^2]. The $\sqrt{\ }$ function is located above the [x^2] key.

When evaluating an expression on paper, you must remember to follow the **order of operations:** (1) parentheses and grouping symbols, (2) exponents and powers, (3) multiplication or division from left to right, and (4) addition or subtraction from left to right. The Casio *fx*-260 calculator is programmed to use the order of operations in a problem with several steps.

EXAMPLE: What is the value of $-3(x + 15)$ when $x = 4$?

THINK: I can use the calculator to evaluate the expression.

Change sign key — Parentheses keys

Press: 3 [+/−] [×] [(---] 4 [+] 15 [---)] [=] [-57]

SOLUTION: The value of the expression is **−57.**

You can also evaluate this expression using paper and pencil. It takes more steps, but you have a record of each step that makes it easier to check your work. Do you use your calculator? Paper and pencil? A combination? Practice with a variety of methods, and use whatever works best for you.

GED Problem

What is the value of the following expression when $x = 9$ and $y = -6$?

$5x^2y + \sqrt{324}$

(1) 2412
(2) 1206
(3) 603
(4) −2412
(5) −4824

THINK: I can use a calculator to find the value.

Step 1: When there are two or more variables, rewrite the expression and substitute the correct values: $5 \times 9^2 \times -6 + \sqrt{324}$.

Step 2: Press: 5 [×] 9 [x^2] [×] 6 [+/−] [+] 324 [Shift] [x^2] [=] [-2412]

ANSWER: (4) −2412

TESTWISE ① ② ③ ④ ⑤

You may find it helpful to use a calculator for only a part of the expression. For instance, in the last example you could first use the calculator to find the square root of 324 and then use paper and pencil to complete the problem.

Apply the Strategy

Directions: Solve the problems below. For problems 1–3, first write an expression by substituting the given values. Then solve. You may use your calculator for all or for part of each problem.

1. What is the value of m^2n when $m = -16$ and $n = 8$?

   (1) –256
   (2) 128
   (3) 256
   (4) 1024
   (5) 2048

   Expression with numbers: _____

   Answer: _____

2. What is the value of the expression below when $r = 25$, $s = 10$, and $t = 4$?

   $$5r - 3st$$

   (1) 5
   (2) 120
   (3) 125
   (4) 240
   (5) 250

   Expression with numbers: _____

   Answer: _____

3. What is the value of $x^2 + (x + 10)$ when x is –4?

   (1) 16
   (2) 22
   (3) 28
   (4) 150
   (5) 610

   Expression with numbers: _____

   Answer: _____

4. What is the value of the expression below when $x = -1$ and $y = -2$?

   $$\frac{8xy}{y^2}$$

   (*Calculator Hint:* Use parentheses to group everything above the fraction bar. Evaluate the numerator and then divide.)

   (1) –4
   (2) –2
   (3) 0
   (4) 2
   (5) 4

5. Evaluate the expression below when $a = 2$ and $b = 4$.

   $$3a^2 + 4b^3$$

   (1) 12
   (2) 36
   (3) 144
   (4) 268
   (5) 720

6. What is the value of the expression $\sqrt{x + y}$ when $x = 16$ and $y = 9$?

   (*Calculator Hint:* Add first; then find the square root.)

   (1) 1
   (2) 2
   (3) 3
   (4) 4
   (5) 5

7. Find the value of the expression below when $p = 3$.

   $$(2p + 5) + p^2$$

   (1) –20
   (2) –10
   (3) 0
   (4) 10
   (5) 20

Answers start on page 40.

STRATEGY 3 Work Backwards to Solve Problems

Most GED algebra problems can be solved quickly by writing and solving an equation. However, you can also solve a problem by working backwards from the answer choices. Try each answer choice in the problem situation and see which one works.

EXAMPLE: Max is 20 years older than twice Brad's age. The sum of their ages is 110. How old is Brad?

(1) 25 (2) 30 (3) 40 (4) 65 (5) 80

THINK: I can work backwards from the answer choices to find the correct answer.

The correct answer choice is Brad's age. If you multiply Brad's age by 2 and add 20, you should get Max's age. The sum of the ages must be 110.

Option (1): If Brad is 25, then Max is 2(25) + 20 = 70. The sum of 20 and 70 is not 110.
Option (2): If Brad is 30, then Max is 2(30) + 20 = 80. The sum of 30 and 80 is 110.
It isn't necessary to try the other options.

SOLUTION: The correct option is **(2) 30.**

GED Problem 1

The sum of three consecutive even numbers is 234. What is the first number in the series?

(1) 82
(2) 80
(3) 78
(4) 76
(5) 74

THINK: I will start with each answer option and add the next two even numbers until I get a sum of 234.

Try the answer options:

(1): 82 + 84 + 86 = 252
(2): 80 + 82 + 84 = 246
(3): 78 + 80 + 82 = 240
(4): 76 + 78 + 80 = 234

ANSWER: (4) 76

Hint: You could eliminate the first three options by adding the numbers in the ones place. For example, you could eliminate (1), since 2 + 4 + 6 = 12 and the sum 234 ends in 4.

GED Problem 2

Together, Sara and Jeff earn $990 per week. If Sara earns $130 more per week than Jeff earns, how much does Jeff earn per week?

(1) $410
(2) $420
(3) $430
(4) $450
(5) $480

THINK: I can work backwards from the answer choices. The correct choice is Jeff's earnings. If I add $130 to that amount, I will have Sara's earnings. Then I add their earnings together to see if the sum is $990.

Try the answer options:

(1): $410 + $130 = $540, and $540 + $410 = $950
(2): $420 + $130 = $550, and $550 + $420 = $970
(3): $430 + $130 = $560, and $560 + $430 = $990

ANSWER: (3) $430

TESTWISE ① ② ③ ④ ⑤

Try the answer options in the order that makes sense to you. For instance, if some of the choices seem unreasonably high or low, start with a more likely choice.

Apply the Strategy

DIRECTIONS: Solve the problems below. For problems 1–3, explain how you can work backwards from the answer choices.

1. Susan has five bills in both $5 and $10 denominations. If the total value of the bills is $35, how many are $5 bills?

   (1) 1
   (2) 2
   (3) 3
   (4) 4
   (5) 5

   Work backwards: _____

   Answer: _____

2. The length of a rectangular field is 12 yards less than the field's width. If the sum of the length and the width is 96 yards, what is the length of the field in yards?

   (1) 22
   (2) 42
   (3) 54
   (4) 56
   (5) 68

   Work backwards: _____

   Answer: _____

3. The sum of three consecutive odd numbers is 57. Which of the following numbers is the largest number in the series?

   (1) 11
   (2) 17
   (3) 19
   (4) 21
   (5) 23

   Work backwards: _____

   Answer: _____

4. Stacey is three times as old as Seth. If the difference in their ages is 18 years, how old is Seth?

   (1) 9
   (2) 12
   (3) 15
   (4) 18
   (5) 27

Problem 5 refers to the following information.

Novelty Trading Company

Item	Price per Dozen
Yo-yo key chains	$14.00
Glitter jump ropes	$12.00
Foam jet gliders	$6.00

5. Maria bought prizes for a fund-raising event from the Novelty Trading Company. She bought the same number of jump ropes as gliders. If she spent $72 in all, how many dozen gliders did she buy?

   (1) 1
   (2) 2
   (3) 4
   (4) 8
   (5) 16

6. Lance has two part-time jobs. Last week he earned a total of $488. He earned $50 more at his job as a security guard than he did at his job at the print shop. How much did he earn at the print shop last week?

   (1) $189
   (2) $219
   (3) $244
   (4) $269
   (5) $438

Answers start on page 40.

STRATEGY 4 Set Up Expressions, Equations, and Functions

Some GED problems require you to choose a correct method for solving the problem. The answer choices may be written as **expressions, equations,** or **functions.**

EXAMPLE: The sum of two numbers is 48. The second number is 15 more than twice the first number. Let n represent the first number. Which of the following equations can be used to find the first number?

(1) $n + 15 = 48$
(2) $2n + 15 = 48$
(3) $2n + 15 + n = 48$
(4) $2n + n = 48$
(5) $2n = 48$

THINK: I can use algebraic language to write an equation.

Step 1: Write expressions for each number. The variable n represents the first number. The second number is 15 more than twice the first number.	Let n = the first number Let $2n + 15$ = the second number
Step 2: Write an expression showing that the sum of the numbers is 48.	$n + 2n + 15 = 48$
Step 3: Compare your equation to the answer choices.	Option (3) $2n + 15 + n = 48$ shows the sum of the same terms, but they are in a different order. Remember, you can add terms in any order without changing the result.

SOLUTION: (3) $2n + 15 + n = 48$

GED Problem

Renting a video arcade for a birthday party costs $200 plus $8 per guest. If x equals the number of guests, which of the functions below can be used to find C, the total cost to rent the arcade?

(1) $C = 8x + 200$
(2) $C = 8(x + 200)$
(3) $C = 200x + 8$
(4) $C = \frac{200}{8x}$
(5) $C = (200)(8x)$

THINK: A function is a type of equation in which one value depends on other values. I need to determine which of the functions could be used to solve the problem.

Step 1: Renting the arcade costs $200 plus $8 per guest. If x is the number of guests, $8x$ is the fee for the guests. If I add 200 to that amount, I get the total cost. One way to write that is: $C = 8x + 200$.

Step 2: Compare. Option (1) is an exact match. Always pay close attention to the parentheses. Option (2) is similar but incorrectly multiplies 8 by the entire expression $x + 200$.

ANSWER: (1) $C = 8x + 200$

TESTWISE ① ② ③ ④ ⑤

You can check your work by substituting a reasonable number in each expression. Does the result make sense? If you had 10 guests, the arcade would cost 8(10) + 200, or $280, a reasonable amount. If you substitute 10 for x in the other options, the result will be too high or low.

Apply the Strategy

Directions: Choose the correct set-up for each problem. For problems 1–3, first decide what the unknown quantity will be.

1. Ally went on a 3-day driving trip. On the 2nd day, she drove 100 miles less than twice the distance she drove on the 1st day. On the 3rd day, she drove twice the distance she drove on the 2nd day. Which of the following expressions represents the miles driven on the 3rd day?

   (1) $4x - 100$
   (2) $3x$
   (3) $2(x - 100)$
   (4) $2x - 100$
   (5) $2(2x - 100)$

   Let $x =$ _____ Answer: _____

2. An annual membership at a swim club costs $30. Members must also pay a $5 monthly locker fee, and a $2 fee each time they use the facility. Which of the following could be used to find the total annual cost (A) for a member? (*Hint:* There are 12 months in a year.)

   (1) $A = 30 + n(5 + 2)$
   (2) $A = 30 + 12(5) + 2n$
   (3) $A = 30 + 5n + 2n$
   (4) $A = 30 + 5(2n)$
   (5) $A = 30n + 5n + 2n$

   Let $n =$ _____ Answer: _____

3. Bill earns $40 more than half Rita's weekly pay. If their combined pay for a week is $520, which of the following could be used to solve for Rita's weekly pay?

   (1) $p + 0.5p + 40 = 520$
   (2) $0.5p + 40 = 520$
   (3) $0.5(p + 40) = 520$
   (4) $40 + 0.5p = 520$
   (5) $(p + 40) + p = 520$

   Let $p =$ _____ Answer: _____

4. Marcus plans to open a checking account. His bank charges a monthly fee of $6 plus $0.10 per check for each check over ten written in the month. There is no charge for the first ten checks. If n = the number of checks and n is always greater than 10, which of the following could be used to find the total amount in bank fees (F) Marcus will pay per month?

   (1) $F = 6 + 0.10n - 10$
   (2) $F = 6 + 0.10n$
   (3) $F = 6 + 0.10(n + 10)$
   (4) $F = 6 + 0.10(n - 10)$
   (5) $F = 6(0.10n) - 10$

5. Maggie is four times as old as her cousin Samuel. In five years, she will be six years less than three times his age. Which of the following could be used to solve for Samuel's age now (x)?

   (1) $4x = 3x - 6$
   (2) $4x = 3x + 5$
   (3) $4x + 5 = 3(x + 5) - 6$
   (4) $4x + 5 = 3(x + 5)$
   (5) $4x + 5 = 3x - 6$

6. One number is equal to the product of -2 and the difference between another number (n) and 5. Which of the following expressions could be used to find the value of the first number?

   (1) $-2(n + 5)$
   (2) $-2(n - 5)$
   (3) $-2 + (n - 5)$
   (4) $-2 + (5 - n)$
   (5) $-2(5n)$

Answers start on page 41.

GED Practice 1: Algebra Word Problems

Part I: You may use a calculator. Refer to the formulas on the back cover as needed.

For questions 1–7, choose the one best answer. For question 8, fill in the grid.

1. What is the value of the following expression when $x = -4$ and $y = -3$?

$$2x^2y + \sqrt{x^2 + y^2}$$

(1) 121
(2) 101
(3) 11
(4) –71
(5) –91

2. Evaluate the expression below when $a = 4$ and $b = 2$.

$$a^2 + 6b^3$$

(1) 16
(2) 28
(3) 44
(4) 64
(5) 388

3. Last week, Ava and John sold $1225 in merchandise. If John sold three times more than Ava, how many dollars worth of merchandise did Ava sell?

(1) $306.25
(2) $408.33
(3) $612.50
(4) $918.75
(5) Not enough information is given.

4. What is the value of the expression below when $x = -25$ and $y = -5$?

$$\frac{xy}{y^2}$$

(1) 125
(2) 25
(3) 5
(4) –5
(5) –125

5. The sum of three consecutive odd numbers is 75. Which of the following numbers is the smallest number in the series?

(1) 21
(2) 23
(3) 25
(4) 27
(5) Not enough information is given.

6. What is the value of m^2n when $m = -20$ and $n = -3$?

(1) –1200
(2) –60
(3) 60
(4) 400
(5) 1200

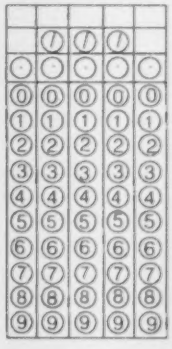
7. Angela has a total of seven nickels and dimes. If the total value of the coins is $0.60, how many coins are nickels?

(1) 1
(2) 2
(3) 3
(4) 4
(5) 5

8. What is the value of the expression below when $r = 5$, $s = 20$, and $t = 4$?

$$5s - 3rt$$

Mark your answer on the grid below.



Part II: You may not use a calculator. Refer to the formulas on the back cover as needed.

For questions 9–13, choose the one best answer. For question 14, fill in the grid.

9. The sum of three consecutive even numbers is 138. What is the largest of these numbers? (*Hint:* Consecutive even numbers can be shown as x, $x + 2$, $x + 4$, and so on.)

   (1) 44
   (2) 46
   (3) 48
   (4) 50
   (5) Not enough information is given.

10. On his delivery route, Roberto drives twice as many miles to his second delivery stop as he does to his first stop. The distance to his third delivery stop is 10 miles less than the distance to his first stop. Which of the following expressions represents the miles Roberto drives to his first three delivery stops?

    (1) $2x + x$
    (2) $3x - 10$
    (3) $3x + (x - 10)$
    (4) $2x - 10$
    (5) $2x + (x - 10)$

11. Raul sold three times as many raffle tickets as Amy. Amy sold $50 more in tickets than Michael. Together they sold $700 in raffle tickets. How many dollars worth of raffle tickets did Raul sell?

    (1) $50
    (2) $100
    (3) $150
    (4) $300
    (5) $450

12. At a local skating rink, the admission cost is $5 for adults, $3 for children between the ages of 7 and 16, and free for children under 7. If the skating rink took in $550 on Saturday, how many adults skated?

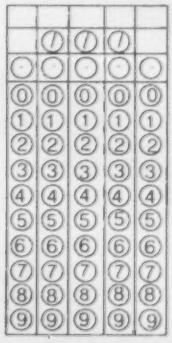
    (1) 110
    (2) 125
    (3) 250
    (4) 500
    (5) Not enough information is given.

13. Marie earns $25 more than three-fourths of Rachel's weekly pay. If their combined earnings for the week are $900, which of the following expressions could be used to solve for Rachel's weekly pay?

    (1) $900 - (p + 0.75p + 25)$
    (2) $900 - 0.75(p + 25)$
    (3) $900 - (0.75p + 25)$
    (4) $900 - [0.75(25) + p]$
    (5) $900 - (p + 25) + p$

14. Richard is seven years older than Lilia. In ten years, the sum of their ages will be 51. How old is Richard now?

    Mark your answer on the grid.



Answers start on page 41.

Evaluation and Action Plan

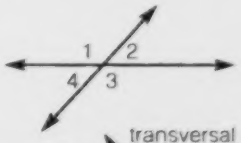
Check your answers. Then evaluate your results and make a plan.

Results:
- ☐ Seven or fewer correct • *Need to study more*
- ☐ Eight to eleven correct • *Need to review*
- ☐ Twelve to fourteen correct • *Ready to move on*

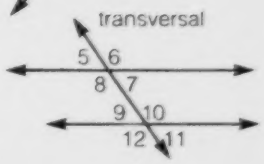
I need to work more on:
- ☐ Using tables (Questions 9, 11, 12, 14)
- ☐ Calculator skills (Questions 1, 2, 4, 5, 7)
- ☐ Working backwards (Questions 3, 6, 8)
- ☐ Set-up problems (Questions 10, 13)

STRATEGY 5 Explore Angle Relationships

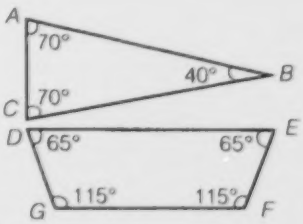
Angles are formed when two lines intersect or when two rays or line segments share a common point. Learn the following concepts to solve angle problems on the GED Math Test.



- When two lines intersect, the angles that are opposite (called **vertical angles**) have equal measures. Note: $m\angle 1$ is read, "the measure of angle 1."
  Example: $m\angle 1 = m\angle 3$, and $m\angle 2 = m\angle 4$.



- When two lines intersect, the sum of each pair of **adjacent angles** is 180°.
  Example: $m\angle 1 + m\angle 2 = 180°$, and $m\angle 2 + m\angle 3 = 180°$.
- When two parallel lines are intersected by a third line (a **transversal**), the angles that are in the same position in relation to the transversal are equal in measure.
  Example: $m\angle 5 = m\angle 9$, and $m\angle 7 = m\angle 11$.



- The sum of the interior angles of a **triangle** is 180°.
  Example: $m\angle A + m\angle B + m\angle C = 180°$.
- The sum of the interior angles of a **four-sided figure** is 360°.
  Example: $m\angle D + m\angle E + m\angle F + m\angle G = 360°$.

EXAMPLE: Two of the angles in a triangle measure 45° and 62°. What is the measure of the third angle?

THINK: I know the sum of the three angles of a triangle must be 180°. I can write an equation to find the missing angle measure.

Let x represent the measure of the third angle: $45° + 62° + x = 180°$

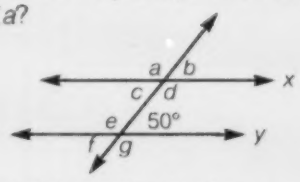
$107° + x = 180°$

$x = 73°$

SOLUTION: The measure of the third angle is **73°.**

GED Problem

In the diagram, lines x and y are parallel. What is the measure of $\angle a$?



(1) 50°
(2) 80°
(3) 130°
(4) 310°
(5) Not enough information is given.

THINK: Since x and y are parallel, $\angle a$ and $\angle e$ are in the same position and are equal.

Step 1: $\angle e + 50° = 180°$, so $\angle e = 130°$

Step 2: Since $\angle e = 130°$, $\angle a = 130°$ as well.

ANSWER: (3) 130°

TESTWISE ① ② ③ ④ ⑤

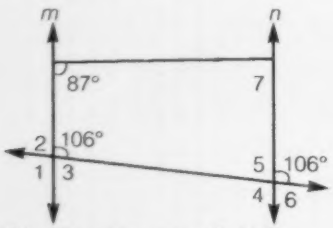
When you look at a drawing on the GED Math Test, don't assume the size of an angle based on how it looks. Apply mathematical rules, such as the ones above.

Apply the Strategy

Directions: Solve the problems below. For problems 1–3, explain the mathematical rule or rules from page 12 that you can use to find the measure of the unknown angle.

Problems 1 and 2 refer to the following figure.

Lines *m* and *n* are parallel.



1. What is the measure of ∠4?

   (1) 74°
   (2) 87°
   (3) 93°
   (4) 106°
   (5) 254°

   Explain: _____

   Answer: _____

2. What is the measure of ∠7?

   (1) 74°
   (2) 87°
   (3) 93°
   (4) 106°
   (5) 254°

   Explain: _____

   Answer: _____

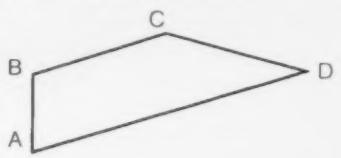
3. Two of the angles in a right triangle measure 90° and 24°. What is the measure of the remaining angle?

   (1) 46°
   (2) 66°
   (3) 114°
   (4) 156°
   (5) 246°

   Explain: _____

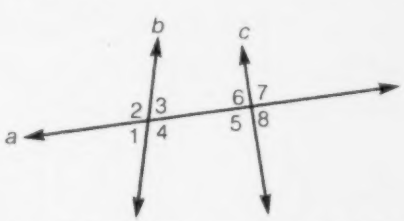
   Answer: _____

4. In figure *ABCD*, ∠*A* is twice the measure of ∠*D*, ∠*B* is four times the measure of ∠*D*, and ∠*C* is five times the measure of ∠*D*. What is the measure of ∠*D*?



   (1) 10°
   (2) 15°
   (3) 30°
   (4) 45°
   (5) Not enough information is given.

Problems 5 and 6 refer to the following figure.



5. If ∠3 measures 63°, what is the measure of ∠1?

   (1) 27°
   (2) 63°
   (3) 117°
   (4) 297°
   (5) Not enough information is given.

6. If ∠4 measures 117°, what is the measure of ∠8?

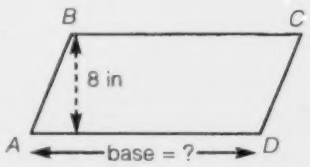
   (1) 63°
   (2) 117°
   (3) 207°
   (4) 243°
   (5) Not enough information is given.

Answers start on page 41.

STRATEGY Use the Formulas Page with Geometry Problems

When you take the GED Math Test, you will be given a list of formulas (shown on the back cover). Sometimes you must solve a problem in which the **perimeter, area,** or **volume** is known but another measure is unknown. Using the correct formula and your knowledge of algebra, you can solve for the missing measure.

EXAMPLE: The area of parallelogram *ABCD* is 120 square centimeters. What is the length of the base of the parallelogram?



THINK: I can use the formula for finding the area of a parallelogram from the GED formulas page on the back cover.

Step 1: Find the formula for the area of a parallelogram.

Area = base × height

Step 2: The height is 8 cm. The base is side *AD*. Substitute the values into the formula and solve for base.

$A = bh$
$120 = b \times 8$
$120 \div 8 = b$
$b = 15$ cm

SOLUTION: The measure of the base is **15 cm.**

GED Problem 1

A crate is 4 feet long and 3 feet wide. If its volume is 54 cubic feet, what is its height in feet?

(1) 4.5
(2) 5.4
(3) 7.7
(4) 13.5
(5) 18

THINK: I can use the formula for finding the volume of a rectangular container.

Step 1: The formula is Volume = length × width × height.

Step 2: Substitute and solve for height:

$V = lwh$
$54 = 4 \times 3 \times h$
$54 = 12h$
$4.5 = h$

ANSWER: (1) 4.5

GED Problem 2

The perimeter of a rectangle is 82 cm. If the rectangle is 13 cm wide, what is its length in centimeters?

(1) 23
(2) 28
(3) 34.5
(4) 56
(5) 69

THINK: I can use the formula for finding the perimeter of a rectangle.

Step 1: The formula is Perimeter = 2 × length + 2 × width.

Step 2: Substitute and solve for length:

$P = 2l + 2w$
$82 = 2l + 2(13)$
$82 = 2l + 26$
$56 = 2l$
$28 = l$

ANSWER: (2) 28

TESTWISE ① ② ③ ④ ⑤

To choose the correct formula from the GED formulas page, picture the shape. Think about what the problem is asking you to find: perimeter, circumference, area, or volume.

Apply the Strategy

Directions: Solve the problems below. For problems 1–3, first write the formula you need to use to solve the problem. Refer to the GED formulas on the back cover.

1. The perimeter of a square mirror is 88 inches. What is the length of each side of the mirror in inches?

   (1) 22
   (2) 20
   (3) 11
   (4) 8
   (5) Not enough information is given.

   Formula: _____

   Answer: _____

2. A plumber has a piece of pipe with a diameter of 4 inches and a volume of 1205.76 cubic inches. What is the height of the pipe in inches?

   (1) 384
   (2) 96
   (3) 8
   (4) 4
   (5) 2

   Formula: _____

   Answer: _____

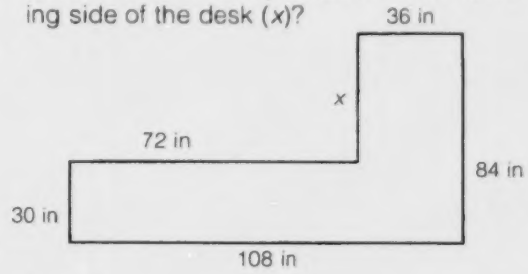
3. A circular trampoline has an area of 153.86 square feet. What is the diameter of the trampoline in feet?

   (1) 49
   (2) 24.5
   (3) 15.386
   (4) 14
   (5) 7

   Formula: _____

   Answer: _____

4. A carpenter cut oak strips for all but one side of this desktop. The perimeter of the desk is 384 inches. What is the length in inches of the oak strip needed for the missing side of the desk (x)?

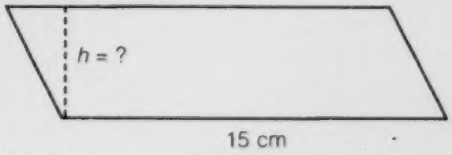


   (1) 48
   (2) 54
   (3) 72
   (4) 126
   (5) 300

5. A wicker trunk has a volume of 9216 square inches. The trunk has a length of 32 inches and a width of 18 inches. What is the height of the trunk in inches?

   (1) 8
   (2) 16
   (3) 18
   (4) 144
   (5) 288

6. The parallelogram shown below has an area of 90 square centimeters. What is the height in centimeters?



   (1) 2
   (2) 3
   (3) 6
   (4) 15
   (5) 37.5

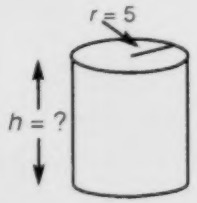
Answers start on page 42.

STRATEGY 7 Use the Calculator with the Formulas Page

When you use a formula to solve for a missing measurement, you are solving an equation. The Casio *fx*-260 calculator that is provided for your use on the GED Math Test can help you solve problems with formulas.

To solve a problem on the GED Math Test, choose the correct formula for the situation from the GED formulas page. This page is reprinted on the back cover of this book. Substitute all known values. Then use the rules of algebra to solve the equation. As you work, write out each step of the algebraic process. Use the calculator for any time-consuming operations.

EXAMPLE: A cylinder has a volume of about 1413 cubic inches. If the radius of its base is 5 inches, what is its height in inches? (On the GED Math Test, use 3.14 for π.)



THINK: I can use the formula for finding the volume of a cylinder from the GED formulas page (see the back cover of this book).

Step 1: Find the formula. Volume = $\pi \times \text{radius}^2 \times \text{height}$

Step 2: Substitute the known values and solve. Remember to use the order of operations.

To square the radius: 5 [x²] [25.]
Multiply: 3.14 [×] 25 [=] [78.5]
Divide: 1413 [÷] 78.5 [=] [18.]

$$\begin{aligned} V &= \pi r^2 h \\ 1413 &= 3.14 \times 5^2 \times h \\ 1413 &= 3.14 \times 25 \times h \\ 1413 &= 78.5h \\ 18 &= h \end{aligned}$$

SOLUTION: The height of the cylinder is **18 inches.**

GED Problem

A work of art is in the shape of a triangle. If the area of its surface is 21.9 square meters and its height is 7.5 meters, what is the length of its base in meters?

(1) 2.92
(2) 3.6
(3) 3.75
(4) 5.84
(5) 10.95

THINK: I can use the formula for finding the area of a triangle:

Step 1: The formula is Area = $\frac{1}{2} \times \text{base} \times \text{height}$.

Step 2: Substitute and solve for the base.

$$\begin{aligned} A &= \tfrac{1}{2}bh \\ 21.9 &= \tfrac{1}{2} \times b \times 7.5 \\ 21.9 &= 3.75b \\ 5.84 &= b \end{aligned}$$

With a calculator: Use .5 for $\frac{1}{2}$ and multiply:

7.5 [×] .5 [=] [3.75]

Divide:

21.9 [÷] 3.75 [=] [5.84]

ANSWER: (4) 5.84

TESTWISE ① ② ③ ④ ⑤

You can check your work by substituting your answer for the variable in the formula. Then simplify both sides of the formula to see whether the sides are equal.

Apply the Strategy

Directions: Solve the problems below. For problems 1–3, first write the formula you need to use to solve the problem. Refer to the GED formulas on the back cover of this book.

Calculator Hint: You can use the fraction key a b/c and the square root function Shift x², shown on page 4.

1. Installers used a total of 75 feet of fencing to fence in a triangular piece of land. If each side of the triangle is equal in length, what is the length of one side in feet?

   (1) 18.75
   (2) 25
   (3) 35
   (4) 50
   (5) Not enough information is given.

   Formula: _____

   Answer: _____

2. A square pyramid has a volume of 768 cubic meters. If the height of the pyramid is 9 meters, what is the length in meters of the edges of the base?

   (1) 256
   (2) 28.4
   (3) 16
   (4) 8
   (5) 4

   Formula: _____

   Answer: _____

3. One seating section of an auditorium is in the shape of a trapezoid. The area of the section is 600 square feet. If the lengths of the bases of the trapezoid are 24 feet and 36 feet, what is the height in feet?

   (1) 540
   (2) 164
   (3) 20
   (4) 15
   (5) 10

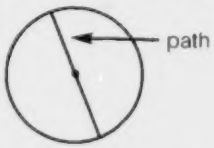
   Formula: _____

   Answer: _____

4. A cone has a volume of 1256 cubic centimeters. If the height of the cone is 12 centimeters, what is the radius of the base in centimeters?

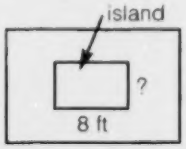
   (1) 40
   (2) 20
   (3) 17.72
   (4) 10
   (5) 5

5. The distance around this circular walking trail is 9.42 kilometers. There is a path that goes from one side of the trail to the other through the center of the circle. What is the distance of this path in kilometers?



   (1) 1.5
   (2) 3
   (3) 6
   (4) 300
   (5) Not enough information is given.

6. This diagram shows a kitchen with an island in the center of the room. The island has an area of 3456 square inches. What is the width of the island in feet?



   (1) 3
   (2) 4
   (3) 43.2
   (4) 48
   (5) 432

Answers start on page 42.

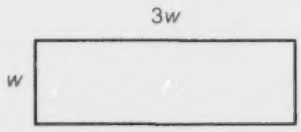
STRATEGY 8 Solve Set-up Problems in Geometry

On the GED Math Test, you will see that some **set-up problems** ask you to choose a correct method for solving a problem. In geometry, the correct method may be related to a formula on the GED formulas page (see the back cover of this book).

Often the best way to solve a set-up problem is to think, "What would I do to solve this problem?" Then look for the choice that matches or is equivalent to your answer.

EXAMPLE: The perimeter of the rectangle shown below is 104 inches. The length is three times the width. Which of the following equations could be used to solve for the width (w) of the rectangle?

(1) $3w + w = 104$
(2) $2(3w) + 2w = 104$
(3) $w + w + w + w = 104$
(4) $3w(w) = 104$
(5) $2w + 3w = 104$



THINK: I can substitute the values that are given into the formula for finding the perimeter of a rectangle (see the formulas page on the back cover of this book).

Step 1: Write expressions for the terms in the problem. If w = width, then $3w$ = length.

Step 2: Choose the formula for perimeter of a rectangle. Substitute the values in the formula.

Perimeter = 2 × length + 2 × width
$104 = 2 \times 3w + 2 \times w$

Step 3: Find an answer choice that matches or is equivalent to your equation. $104 = 2 \times 3w + 2 \times w$ can also be written as $104 = 2(3w) + 2w$

SOLUTION: (2) $2(3w) + 2w = 104$

GED Problem

Two of the angles of a triangle measure 20° and 25°. Which of the following expressions could be used to find the measure of the third angle?

(1) 90° – 20° + 25°
(2) 90° – 20° – 25°
(3) 180° – 20° + 25°
(4) 180° – (20° + 25°)
(5) (20° + 25°) – 180°

THINK: I know that the sum of the three angles in a triangle equals 180°. I can solve the problem by subtracting the known angles from 180°.

Step 1: Write an expression to solve the problem. The expression 180° – 20° – 25° would work, but none of the answer choices show this option.

Step 2: Find an equivalent answer option. Option (4) also subtracts both 20° and 25° from 180°. Option (4) equals the expression in Step 1.

ANSWER: (4) 180° – (20° + 25°)

TESTWISE ① ② ③ ④ ⑤

If you are unsure of a set-up choice, solve the problem your way and solve the set-up you are considering. If the answers are the same, your choice is probably correct.

Apply the Strategy

Directions: Solve the problems below. For problems 1–3, first write the geometric concept (page 12) or formula (back cover) you need to use to answer the question.

1. The two equal angles in an isosceles triangle each measure 50°. Which of the following expressions could be used to find the measure of the third angle of the triangle?

   (1) $180° - 50°$
   (2) $180° - (50° \times 2)$
   (3) $180° + (50° \times 2)$
   (4) $50° \times 2$
   (5) $180° - 50° - 2$

   Formula or Concept: _____

   Answer: _____

2. Which of the following expressions could be used to find the circumference of a circle that has a diameter of 9 centimeters?

   (1) $\pi(4.5^2)$
   (2) $\pi(9^2)$
   (3) $\pi(4.5)$
   (4) $\pi(9)$
   (5) Not enough information is given.

   Formula or Concept: _____

   Answer: _____

3. A triangle has an area of 224 square inches. If the height of the triangle is 14 inches, which of the following equations could be used to find the length of the base?

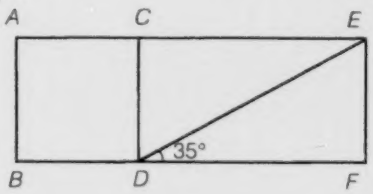
   (1) $\frac{b \times 14}{2} = 224$
   (2) $(b \times 14) \times 2 = 224$
   (3) $b \times 14 = 224$
   (4) $b + 14 = 224$
   (5) $2b \times 14 = 224$

   Formula or Concept: _____

   Answer: _____

Problems 4 and 5 refer to the figure below.

Figure *ABCD* is a square. Figure *ABFE* is a rectangle.



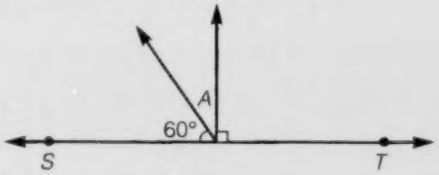
4. Which of the following expressions could be used to find the measure of $\angle CED$?

   (1) $180° - 35°$
   (2) $35° \times 2$
   (3) $180° - 90° - 35°$
   (4) $180° - 90° - 55°$
   (5) $90° - 35°$

5. Length *BF* is three times the width of *AB*. If the area of rectangle *ABFE* is 12 square centimeters, which of the following equations could be used to find the length of *BF*?

   (1) $3w \times w = 12$
   (2) $w^2 = 12$
   (3) $\frac{w}{3} \times w = 12$
   (4) $w + 12 = 3w$
   (5) $4w = 12$

6. Which of the following equations could be used to find the measure of $\angle A$?

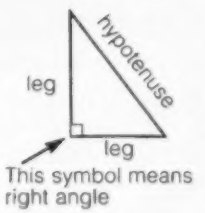


   (1) $180° - 60° = m\angle A$
   (2) $60° + m\angle A + 90° = 180°$
   (3) $m\angle A + 90° = 180°$
   (4) $60° + m\angle A = 180°$
   (5) Not enough information is given.

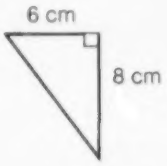
Answers start on page 42.

STRATEGY 9 Use the Pythagorean Relationship

A **right triangle** has two legs that form a right angle and a hypotenuse. The **hypotenuse** is the side across from the right angle, and the longest of the three sides. The Pythagorean relationship shows how to find one side of a right triangle when the measures of the other two sides are known. Using c to represent the hypotenuse and a and b for the legs, the Pythagorean relationship can be stated as $c^2 = a^2 + b^2$. This formula will be given on the GED formulas page (see back cover).



EXAMPLE: The measures of two sides of a right triangle are shown in the diagram. What is the measure of the third side?



THINK: I know the measures of the legs. I need to find the hypotenuse.

$c^2 = a^2 + b^2$ $\quad c^2 = 6^2 + 8^2$ $\quad c^2 = 36 + 64$ $\quad c^2 = 100$
To find the value of c, find the square root of 100. $\sqrt{100} = 10$

SOLUTION: The measure of the third side is **10 cm.**

To do the problem on your calculator, press: 6 [x^2] [+] 8 [x^2] [=] [Shift] [x^2]
The display reads: [10]

GED Problem 1

The longest side of a right triangle is 13 inches. The shortest side is 5 inches. What is the length in inches of the remaining side?

(1) 6
(2) 8
(3) 9
(4) 12
(5) 18

THINK: The longest side is the hypotenuse. I need to find the measure of one of the legs.

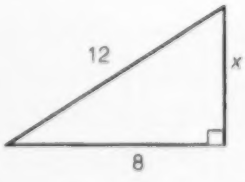
Use the Pythagorean relationship: $c^2 = a^2 + b^2$.
$13^2 = 5^2 + b^2$
$169 = 25 + b^2$
$144 = b^2$
$b = \sqrt{144} = 12$ inches

ANSWER: (4) 12

GED Problem 2

Which of the following equations could be used to find the length of side x?

(1) $x^2 = 8^2 + 4^2$
(2) $x^2 = 12^2 - 8^2$
(3) $x^2 = 12^2 + 8^2$
(4) $x^2 = 12^2 - 4^2$
(5) $x^2 = 13^2 - 12^2$



THINK: The sides that measure 8, 12, and x form a right triangle. Side x is one of the legs.

$c^2 = a^2 + b^2$
$12^2 = 8^2 + x^2$
$12^2 - 8^2 = x^2$

ANSWER: (2) $x^2 = 12^2 - 8^2$

TESTWISE ① ② ③ ④ ⑤

On the GED Math Test, read right triangle problems carefully and judge whether they are asking you to find one of the sides. If so, use the Pythagorean relationship.

Apply the Strategy

Directions: Solve the problems below. For problems 1–3, decide whether you need to solve for the measure of a leg or the hypotenuse. You may use a calculator.

1. The shortest side of a right triangle measures 4.5 cm. The longest side measures 7.5 cm. What is the measure of the third side in centimeters?

   (1) 5.0
   (2) 5.5
   (3) 6.0
   (4) 6.5
   (5) 7.0

   Leg or Hypotenuse? _____

   Answer: _____

2. The two shorter sides of a right triangle measure 7 and 24 inches. What is the measure of the third side in inches?

   (1) 31
   (2) 25
   (3) 23
   (4) 17
   (5) Not enough information is given.

   Leg or Hypotenuse? _____

   Answer: _____

3. Two strips of paper, 18 inches and 24 inches long, are glued to form a right angle. A third strip is cut to form a triangle. What is the length of the third strip in inches?

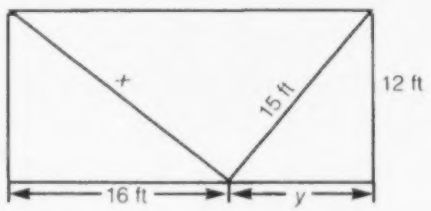
   (1) 42
   (2) 36
   (3) 34
   (4) 30
   (5) 16

   Leg or Hypotenuse? _____

   Answer: _____

Problems 4 and 5 refer to the following diagram.

A rectangular frame has two diagonal braces as shown below.



4. Which of the following expressions could be used to find the length of x in feet?

   (1) $\sqrt{16^2 + 12^2}$
   (2) $\sqrt{16^2 - 15^2}$
   (3) $\sqrt{16^2 - 12^2}$
   (4) $16^2 - 12^2$
   (5) $16^2 + 15^2$

5. What is the length in feet of y?

   (1) 5.2
   (2) 9
   (3) 19.2
   (4) 27
   (5) Not enough information is given.

6. Two sides of a right triangle measure 12 inches and 16 inches. What is the measure of the third side in inches?

   (1) 4
   (2) 10.6
   (3) 20
   (4) 28
   (5) Not enough information is given.

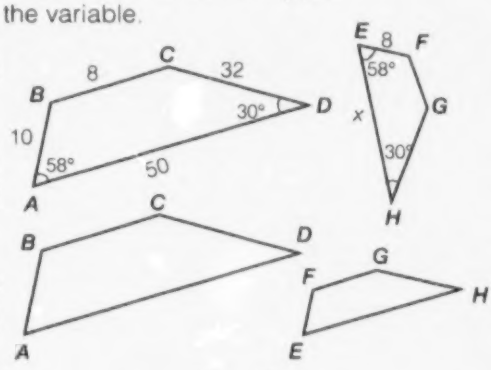
Answers start on page 42.

STRATEGY 10 Use Proportion with Similar Figures

In general, saying that two things are similar means they are alike in some way. In geometry, two figures are similar if they have equal angle measures and corresponding sides that are proportional. Another way to think about this concept is to remember that **similar figures** have the same shape but do not have to be the same size.

When two figures are similar, you can use proportion to find a missing measurement. Write two equal ratios with a variable for the missing measurement. Cross multiply to simplify the equation. Then divide to find the value of the variable.

EXAMPLE: Figure *ABCD* is similar to figure *EFGH*. What is the measure of *EH*?



THINK: The problem states that the figures are similar. I need to find two pairs of corresponding sides and set up a proportion.

Step 1: Two angles are marked in each figure. The angles are equal, so use them to find corresponding sides. Imagine turning the smaller figure to line it up with the larger one. *AB* corresponds to *EF*, and *AD* corresponds to *EH*.

$$\frac{AB}{EF} = \frac{AD}{EH}$$

Step 2: Set up a proportion. Fill in the known values. Use x for *EH*. Solve. Cross multiply, and divide to solve for x.

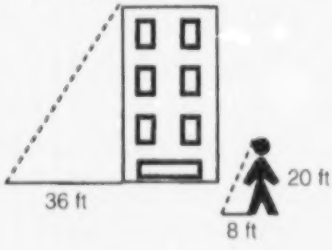
$$\frac{10}{8} = \frac{50}{x}$$
$$10x = 8(50)$$
$$10x = 400$$
$$x = 40$$

SOLUTION: Side *EH* measures **40**.

GED Problem

A building casts a shadow 36 feet in length at the same time that a statue casts an 8-foot shadow. If the statue is 20 feet in height, how many feet in height is the building?

(1) 14.4
(2) 48
(3) 64
(4) 90
(5) 160



THINK: The problem describes two similar triangles. The sun's rays are the third side of each triangle. Making a sketch will help me understand the problem and find the corresponding sides.

Write a proportion:

$$\frac{\text{statue's shadow}}{\text{building's shadow}} = \frac{\text{statue's height}}{\text{building's height}}$$

$$\frac{8}{36} = \frac{20}{x}$$
$$8x = 20(36)$$
$$8x = 720$$
$$x = 90$$

ANSWER: (4) 90

TESTWISE ① ② ③ ④ ⑤

To solve a proportion, multiply the two known numbers that are diagonal to each other, and divide by the remaining number. For example, to solve $\frac{8}{36} = \frac{20}{x}$ for x, use the expression $20(36) \div 8$ or $\frac{20(36)}{8}$.

Apply the Strategy

Directions: Solve the problems below. For problems 1–3, write a proportion you can use to answer the question. Make a sketch if it will help you understand the problem.

1. A rectangle has a length of 12.5 centimeters and a width of 7.5 centimeters. A similar rectangle has a width of 3 centimeters. What is the length of this rectangle in centimeters?

   (1) 3
   (2) 4
   (3) 5
   (4) 6.25
   (5) 25

   Proportion: _____

   Answer: _____

2. The dimensions of a rectangular window are 72 inches by 48 inches. An architect makes a scale drawing of the window. The longer side of the scale drawing is 3 centimeters. What is the length in centimeters of the shorter side of the drawing?

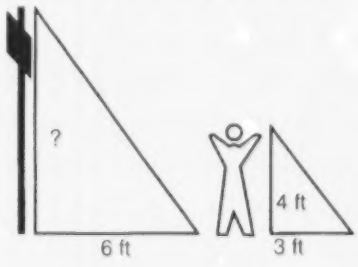
   (1) 1
   (2) 2
   (3) 4.5
   (4) 8
   (5) 1152

   Proportion: _____

   Answer: _____

3. A sign pole casts a 6-foot shadow. At the same time of day, a 4-foot child casts a 3-foot shadow. What is the height of the pole in feet?

   (1) 2
   (2) 4.5
   (3) 6
   (4) 8
   (5) 12



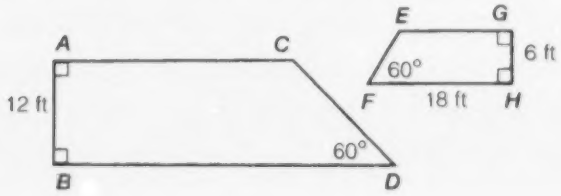
   Proportion: _____

   Answer: _____

4. An isosceles triangle has two equal sides that measure 3 inches and a third side that measures 2 inches. A similar isosceles triangle has two equal sides that measure 15 inches. What is the length of the third side of this triangle in inches?

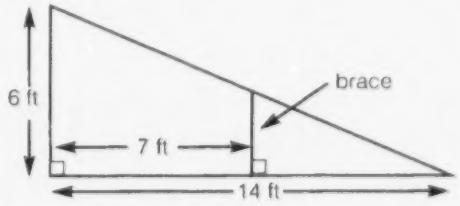
   (1) 22.5
   (2) 14
   (3) 10
   (4) 0.4
   (5) Not enough information is given.

5. Trapezoid *ABCD* is similar to trapezoid *EFHG*. What is the length of side *BD*?



   (1) 4
   (2) 9
   (3) 24
   (4) 36
   (5) 54

6. The diagram below shows a side view of a ramp. The larger triangle is partially made up of a smaller, similar triangle. Based on the information, what is the height of the brace in feet?



   (1) 3
   (2) 4
   (3) 12
   (4) 16.3
   (5) Not enough information is given.

Answers start on page 43.

GED Practice 2: Angles, Formulas, and Similar Figures

Part I: You may use a calculator. Refer to the formulas on the back cover as needed.

For questions 1–5, choose the one best answer. For question 6, fill in the grid.

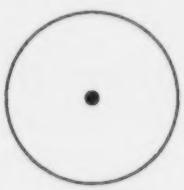
1. A lighted sign is in the shape of a triangle. If the area of its surface is 10.5 square meters and its height is 3.5 meters, what is the length of its base in meters?

   (1) 3
   (2) 6
   (3) 7
   (4) 14
   (5) 21

2. Two of the angles in a triangle measure 60° and 45°. What is the measure of the remaining angle?

   (1) 45°
   (2) 60°
   (3) 75°
   (4) 90°
   (5) 255°

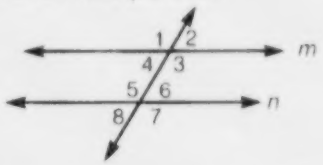
3. The distance around a circular training pen is 125.6 feet. If Charles wants to plant a post directly in the center of the pen, how many feet from the edge of the pen does he need to place the post?



   (1) 10
   (2) 20
   (3) 40
   (4) 62.8
   (5) Not enough information is given.

Questions 4 and 5 refer to the following figure.

Lines *m* and *n* are parallel.



4. If the measure of ∠2 is 65°, what is the measure of ∠4?

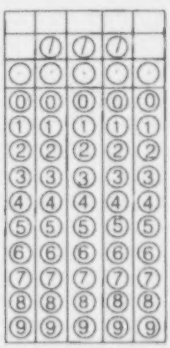
   (1) 295°
   (2) 180°
   (3) 115°
   (4) 65°
   (5) 25°

5. What is the measure of ∠7?

   (1) 295°
   (2) 180°
   (3) 115°
   (4) 65°
   (5) 25°

6. Copies of a 3-foot-wide by 5-foot-long painting are 12 inches long. If the copies are similar in shape to the original painting, what is the width in inches of the copies?

   Mark your answer on the grid below.



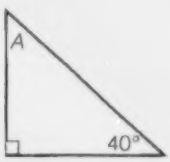
Part II: You may not use a calculator. Refer to the formulas on the back cover as needed.

For questions 7–10, choose the one best answer. For question 11, fill in the grid.

7. Two angles in a triangle each measure 30°. Which of the following expressions could be used to find the measure of the third angle of the triangle?

   (1) $180° - (30° \times 2)$
   (2) $180° - 30°$
   (3) $180° + (30° \times 2)$
   (4) $30° \times 2$
   (5) $180° - 30° \times 2$

8. In the triangle below, which of the following equations could be used to find the measure of $\angle A$?

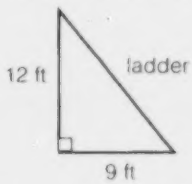


   (1) $180° - 40° = m\angle A$
   (2) $40° + m\angle A + 90° = 180°$
   (3) $m\angle A + 90° = 180°$
   (4) $40° + 90° = m\angle A$
   (5) Not enough information is given.

9. A tree casts a shadow 100 feet in length. At the same time, a 5-foot post casts a shadow 20 feet in length. How many feet tall is the tree?

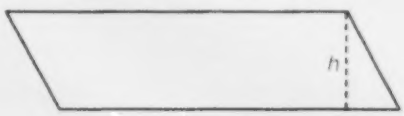
   (1) 4
   (2) 5
   (3) 25
   (4) 120
   (5) 125

10. Which of the following could be used to find how many feet the ladder is extended?

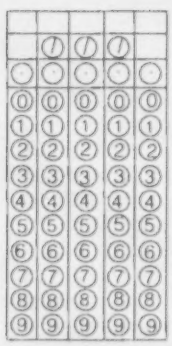


   (1) $\sqrt{9^2 + 12^2}$
   (2) $\sqrt{9 + 12}$
   (3) $\sqrt{12^2 - 9^2}$
   (4) $12^2 - 9^2$
   (5) $9^2 + 12^2$

11. The parallelogram shown below has an area of 375 square millimeters. What is the height of the figure in millimeters?



Mark your answer on the grid.



Answers start on page 43.

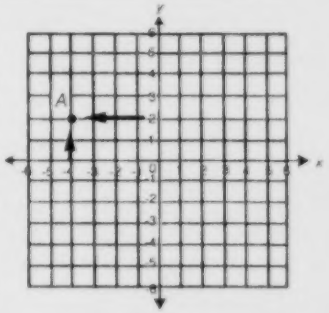
Evaluation and Action Plan

Check your answers. Then evaluate your results and make a plan.

Results	I need to work more on:
Five or fewer correct • *Need to study more* Six to eight correct • *Need to review* Nine to eleven correct • *Ready to move on*	☐ Angles (Questions 2, 4, 5) ☐ Formulas (Question 11) ☐ Calculator skills (Questions 1, 3) ☐ Set-up problems (Questions 7, 8) ☐ Pythagorean relationship (Question 10) ☐ Similar figures (Questions 6, 9)

STRATEGY 11 Plot Points on Coordinate Grids

The **coordinate grid** is a system of lines that we use to locate points on a plane. Each point has its own address. The address, or **coordinates** of a point, is a pair of numbers, including both positive and negative numbers. The first number locates the point horizontally along the ***x*-axis.** The second number shows the point's location in relation to the vertical ***y*-axis.** On the grid to the right, point *A* is located at (–4,2).

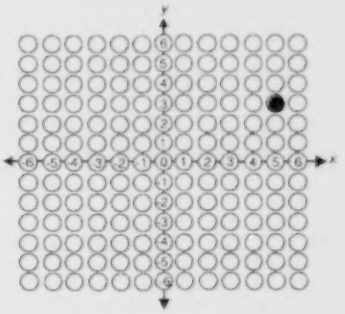


On the GED Math Test, some of the questions will ask you to fill in a circle on a special coordinate grid to show the location of a point.

EXAMPLE: Plot a point with coordinates (5,3) on the grid.

THINK: The first number shows the location along the *x*-axis. The second number shows the location along the *y*-axis.

Start at the **origin** (0,0). On this special GED coordinate grid, the circle marked 0 is the origin. Count 5 circles to the right along the *x*-axis. Then count 3 circles up along the *y*-axis. Fill in the circle.



SOLUTION: See the grid shown at the right.

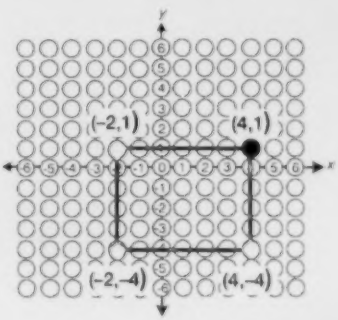
GED Problem

A rectangle is drawn on a coordinate grid. Its vertices, or corners, are located at (–2,–4), (–2,1), and (4,–4). At what point is the fourth vertex?

Mark your answer on the coordinate plane grid.

THINK: I know a rectangle has four sides, and the opposite sides are equal. I can lightly plot the three points given in the problem and then determine where the fourth point must be placed.

First, lightly plot the three points given in the problem. If you use your answer sheet for this purpose, make very light marks and be sure to erase them so they are not confused with your answer.



To form a rectangle, the fourth point must be located at (4,1). Fill in this circle on the answer grid. The answer is shown to the right.

TESTWISE
① ② ③ ④ ⑤

To mark a point (*x*,*y*) on the GED coordinate grid, start with the *x*-value and count to the right if the number is positive or to the left if it is negative. Then count the number of places for the *y*-value: up if it is positive or down if it is negative. Fill in the circle carefully, but erase completely if you change your answer.

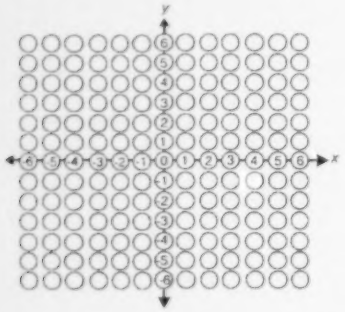
Apply the Strategy

Directions: Solve the problems below. For problems 1 and 2, write the answer first as a coordinate pair. Then mark your answers on the coordinate plane grids provided.

1. A point has an *x*-coordinate of 3 and a *y*-coordinate of –2. What is the location of the point on the coordinate grid?

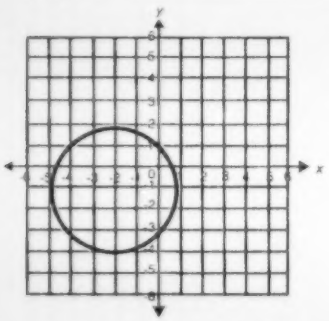
   Coordinate pair: _____

   Mark your answer on the blank coordinate grid below.

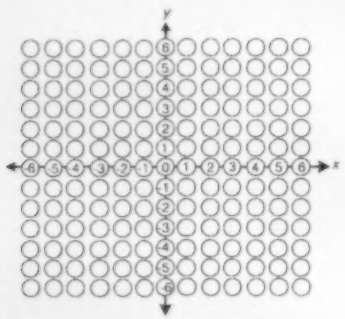


2. The coordinate grid below shows the graph of a circle. What point is located at the center of the circle?

   Coordinate pair: _____

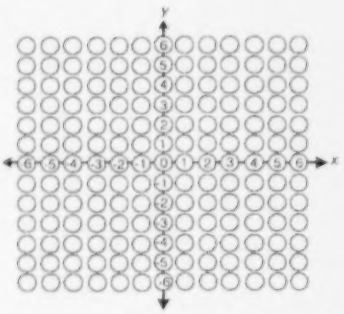


   Mark your answer on the blank coordinate grid below.

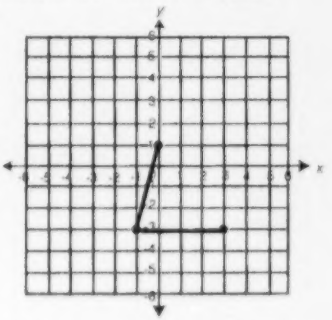


3. A point has an *x*-coordinate of –4 and a *y*-coordinate of –2. What is the location of the point on the coordinate grid?

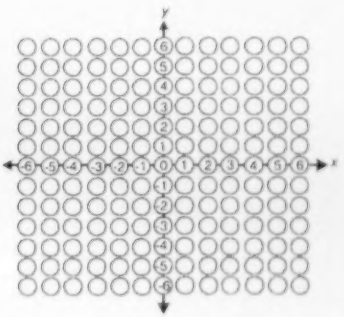
   Mark your answer on the blank coordinate grid below.



4. The coordinate grid below shows the location of three vertices of a parallelogram. At what point is the fourth vertex?



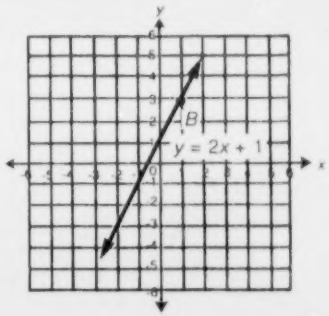
   Mark your answer on the blank coordinate grid below.



Answers start on page 43.

STRATEGY 12 Find Points on a Line

A **linear equation** is an equation that has terms with only x and y variables. Each pair of possible values for x and y are the coordinates for a point on a line. The line to the right is a graph of the equation $y = 2x + 1$. As you can see, point B at (1,3) lies on the line.



To prove a point is on a line, substitute the coordinates of the point into the equation. For point B, let $x = 1$ and $y = 3$. Substitute the value for x in the equation $y = 2x + 1$. Since the result is $y = 3$, you know point (1,3) is on the line.

$y = 2x + 1$
$y = 2(1) + 1$
$y = 2 + 1$
$y = 3$

To graph a line, make a table of values. Choose any value for x. Start with zero or a whole number close to zero on the number line. Then substitute this value into the equation and solve for y. You must know at least two points to draw the line. Finding three points will help you guard against careless mistakes.

EXAMPLE: Graph the equation $y = x - 2$.

THINK: I will substitute 3 values for x and make a table of values for x and y to find points on the line.

Step 1: Make a table of values for three values.

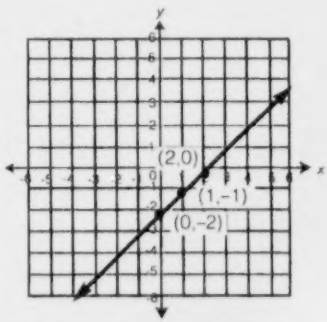
Step 2: Plot the points on the coordinate grid.

Step 3: Draw a line through the points.

SOLUTION: See the grid shown at the right.

For $y = x - 2$

If x =	then y =
0	−2
1	−1
2	0



GED Problem

Point A at (−1,−2) and point B at (1,2) lie on the same line. Which of the following is the equation of the line?

(1) $y = 3x$
(2) $y = 2x$
(3) $y = 2x + 1$
(4) $y = 2x + 2$
(5) $y = x + 2$

THINK: If a point lies on the line, its coordinates will make the equation true. I can substitute the coordinates of point A into each equation. If A is true, I will also try point B.

(1): $y = 3x$
$-2 \neq 3(-1)$
$-2 \neq -3$
Point A does not make $y = 3x$ true.

(2): $y = 2x$ $\qquad$ $y = 2x$
$-2 = 2(-1)$ $\qquad$ $2 = 2(1)$
$-2 = -2$ $\qquad$ $2 = 2$
Both points make $y = 2x$ true.

ANSWER: (2) $y = 2x$

TESTWISE ① ② ③ ④ ⑤

If you are given a graph of a line and need to match a linear equation to that line, select two points on the line and substitute the coordinates into each equation until both points make an equation true.

Apply the Strategy

Directions: Solve the problems below. For problems 1–3, make a table of values using the graph or the equation given.

1. Which equation of a line is graphed below?

(1) $y = x - 1$
(2) $y = -x$
(3) $y = x + 1$
(4) $y = x - 3$
(5) $y = 1 - x$

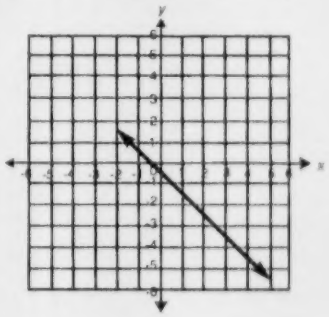


Table of values:

x	0	1	2	3
y				

Answer: _____

2. Which ordered pair is a solution of the equation $y = 3x - 2$?

(1) (–2,0)
(2) (4,2)
(3) (2,4)
(4) (1,–1)
(5) (1,2)

Table of values:

x	–2	1	2	4
y				

Answer: _____

3. The graph of the equation $y = -2x$ passes through which coordinate pair?

(1) (2,–4)
(2) (2,4)
(3) (1,1)
(4) (–2,1)
(5) (–6,3)

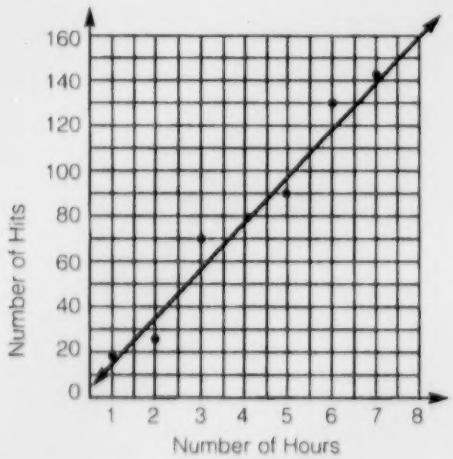
Table of values:

x	1	2	–2	–6
y				

Answer: _____

Problems 4 and 5 refer to the following graph and information.

The graph shows the number of hits received by a website in an 8-hour period. The line of best fit can be used to predict the number of hits expected in different time periods.



4. Using the line of best fit, what is a reasonable prediction for the number of hits the website will receive in an 8-hour period?

(1) 170
(2) 160
(3) 150
(4) 140
(5) 80

5. Based on the line of best fit, about how many hours would you predict it would take for the website to get 70 hits?

(1) 2
(2) 3
(3) 3.5
(4) 4
(5) 7

Answers start on page 44.

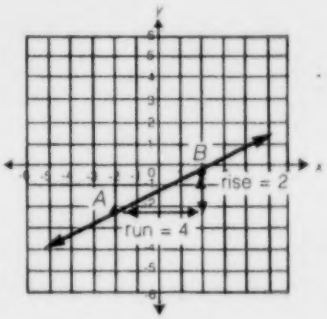
STRATEGY 13 Find Slope on a Coordinate Grid

Slope is a measure of the steepness of a line. To find the slope, write the ratio of the rise of the line to the run. Think of a flight of stairs. If you were walking up the stairs shown to the right, each step would take you up and forward. The upward movement is the rise, and the forward movement is the run.

On a coordinate grid, slope is said to be **positive** when the line rises as it goes from left to right. The slope is said to be **negative** if the line moves downward as it goes from left to right.

If a line is drawn on a coordinate grid, you can often find the slope easily by counting spaces to find the rise and the run. You can also use the slope formula provided on the GED formulas page (see the back cover of this book). Use whichever method is easier for you.

EXAMPLE: What is the slope of line *AB* shown on the grid to the right?



THINK: I will count spaces to find the rise and run between points *A* and *B* on the line.

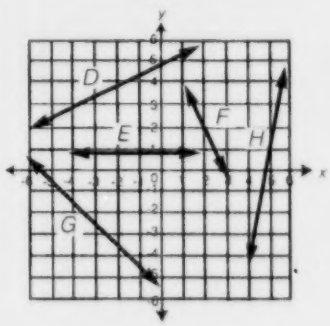
Locate the two points and draw an imaginary staircase step connecting the two points. Look at the step. The step rises 2 spaces and runs 4 spaces forward. Write the ratio: $\frac{\text{rise}}{\text{run}} = \frac{2}{4} = \frac{1}{2}$. The slope is $\frac{1}{2}$.

SOLUTION: The slope of line *AB* is $\frac{1}{2}$.

GED Problem

Which of the lines on the coordinate grid below has a slope of –1?

(1) *D*
(2) *E*
(3) *F*
(4) *G*
(5) *H*



THINK: I can count spaces to find a slope of –1.

Step 1: Examine each line. A line with a negative slope moves downward from left to right, so we can eliminate lines *D*, *E*, and *H*. Lines *D* and *H* have a positive slope, and Line *E* has a slope of 0.

Step 2: Find the slope for lines *F* and *G*. Line *F* goes down 2 spaces for each 1 space it runs, for a slope of $-\frac{2}{1}$ or –2. Line *G* goes down 1 space for each 1 space it runs, for a slope of $-\frac{1}{1}$ or –1. Line *G* is the correct answer.

ANSWER: (4) *G*

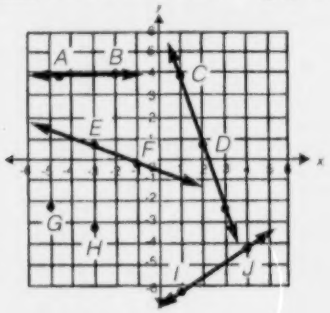
TESTWISE
① ② ③ ④ ⑤

When an equation is written in the form $y = mx + b$, where m is one number and b is another, the value for m is the slope. Example: If you graph the equation $y = -2x + 3$, the slope is –2.

Apply the Strategy

Directions: Solve the problems below. For problems 1–3, write a ratio showing $\frac{\text{rise}}{\text{run}}$.

Problems 1–3 refer to the following grid.



1. What is the slope of line *CD*?

   (1) 3
   (2) $-\frac{1}{3}$
   (3) $-\frac{2}{3}$
   (4) –1
   (5) –3

   Ratio: _____

   Answer: _____

2. What is the slope of the line that passes through points *A* and *B*?

   (1) 0
   (2) $\frac{1}{3}$
   (3) 1
   (4) 3
   (5) Not enough information is given.

   Ratio: _____

   Answer: _____

3. What would the slope be of a line that connects points *H* and *I*?

   (1) $\frac{4}{3}$
   (2) $\frac{3}{4}$
   (3) $-\frac{3}{4}$
   (4) –1
   (5) $-\frac{3}{2}$

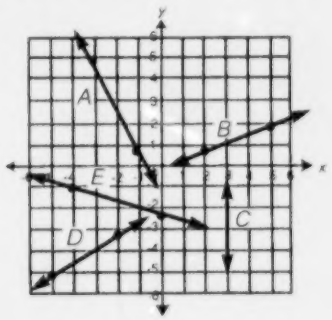
   Ratio: _____

   Answer: _____

4. A line passes through two points with the coordinates (5,1) and (4,–4). What is the slope of this line? (*Hint:* Use the formula for slope of a line, given on the back cover of this book.)

   (1) 5
   (2) 3
   (3) $\frac{1}{5}$
   (4) –5
   (5) Not enough information is given.

Problems 5 and 6 refer to the following diagram.



5. What is the slope of line *E*?

   (1) $\frac{1}{4}$
   (2) $-\frac{1}{4}$
   (3) $-\frac{1}{3}$
   (4) $-\frac{1}{2}$
   (5) –4

6. Which line has a slope of $\frac{2}{3}$?

   (1) *A*
   (2) *B*
   (3) *C*
   (4) *D*
   (5) *E*

Answers start on page 44.

STRATEGY 14 Find the Distance Between Points

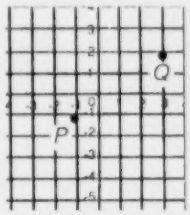
Some problems will ask you to find the distance between two points on a coordinate grid. If you are given only the coordinates of the points, use the formula below from the Coordinate Geometry section of the GED formulas page (see the back cover of this book).

distance between points $= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$; (x_1,y_1) and (x_2,y_2) are two points on a line

To use the formula, choose one point to be (x_1,y_1) and the other to be (x_2,y_2). Substitute the coordinates and evaluate, or solve, the formula.

If the coordinate grid is shown or if you can draw one quickly, you can use your knowledge of right triangles to solve the problem. Use the Pythagorean relationship (see Strategy 9 on page 20).

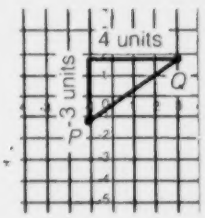
EXAMPLE: What is the distance between points *P* and *Q* on the coordinate grid shown to the right?



THINK: I will draw a right triangle so that the distance between *P* and *Q* is the hypotenuse.

Step 1: Draw a right triangle so that the distance between the points is the hypotenuse, or longest side, of the triangle.

Step 2: Count units to find the lengths of the legs of the triangle.



Step 3: Use the Pythagorean relationship to solve for the hypotenuse.
$c^2 = a^2 + b^2 \quad c^2 = 3^2 + 4^2 \quad c^2 = 9 + 16 \quad c^2 = 25 \quad c = \sqrt{25} = 5$

SOLUTION: The distance between points *P* and *Q* is **5 units.**

GED Problem

Point *M* is located at (–6,5). Point *N* is located at (6,0). What is the distance between points *M* and *N* in units?

(1) 6
(2) 10
(3) 11
(4) 13
(5) 17

THINK: Since the problem doesn't show the points on a coordinate grid, I can use the formula for finding the distance between points.

Let $(x_1,y_1) = (6,0)$ and $(x_2,y_2) = (-6,5)$.

Distance between points $= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

ANSWER: (4) 13

$= \sqrt{(-6 - 6)^2 + (5 - 0)^2}$
$= \sqrt{(-12)^2 + 5^2}$
$= \sqrt{144 + 25}$
$= \sqrt{169} = 13$ units

TESTWISE ① ② ③ ④ ⑤

A formulas page is provided on the GED Math Test. The formulas page is duplicated on the back cover of this book. Become familiar with these formulas before you take the GED Math Test.

Apply the Strategy

Directions: Solve the problems below. You may use a calculator. For problems 1–3, write an expression or equation that can be used to find the answer.

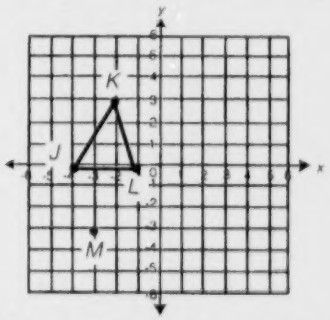
1. Point R is located at (8,4). A line is drawn from this point to point S, which is identified by the coordinates (3,–2). What is the length of this line to the nearest whole unit?

   (1) 6
   (2) 7
   (3) 8
   (4) 11
   (5) 61

   Expression or Equation: _____

   Answer: _____

Problems 2 and 3 refer to the following diagram.



2. What is the length, to the nearest whole unit, of side KL in the triangle above?

   (1) 3
   (2) 4
   (3) 5
   (4) 9
   (5) 26

   Expression or Equation: _____

   Answer: _____

3. A line is drawn from point M to point L. What is the length of this line to the nearest tenth of a unit?

   (1) 169.0
   (2) 13.0
   (3) 3.7
   (4) 3.6
   (5) 3.0

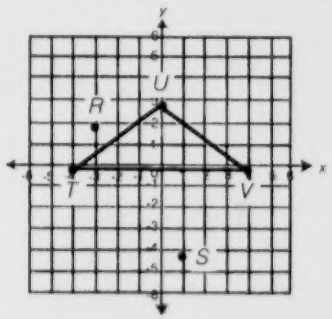
   Expression or Equation: _____

   Answer: _____

4. Point L is located at (5,7) and point M is at (–3,–4). To the nearest whole unit, what is the distance between the two points?

   (1) 2
   (2) 13
   (3) 14
   (4) 185
   (5) Not enough information is given.

Problems 5 and 6 refer to the following diagram.



5. What is the perimeter of triangle TUV? (*Hint:* Sides TU and UV are congruent.)

   (1) 10
   (2) 12
   (3) 14
   (4) 15
   (5) 18

6. To the nearest whole unit, what is the distance between points R and S on the grid?

   (1) 6
   (2) 7
   (3) 8
   (4) 10
   (5) Not enough information is given.

Answers start on page 44.

GED Practice 3: Slope, Distance, and Coordinate Grids

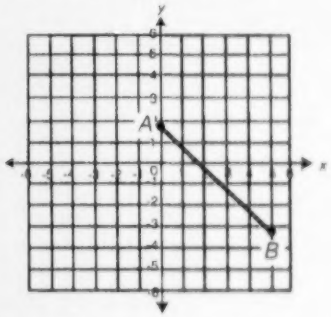
Part I: You may use a calculator. Refer to the formulas on the back cover as needed.

For questions 1–3, choose the one best answer. For questions 4 and 5, fill in the grids.

1. Which ordered pair is a solution of the equation $y = 5x - 3$?

   (1) (–2,–10)
   (2) (–1,2)
   (3) (0,–3)
   (4) (1,–2)
   (5) (2,–6)

2. What is the slope of line *AB*?



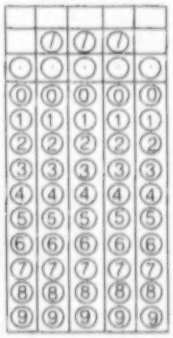
   (1) 5
   (2) 1
   (3) $-\frac{1}{5}$
   (4) –1
   (5) –5

3. Point *R* is located at (4,–3). Point *S* is located at (0,–1). To the nearest whole unit, what is the distance between points *R* and *S*?

   (1) 2
   (2) 4
   (3) 6
   (4) 10
   (5) 20

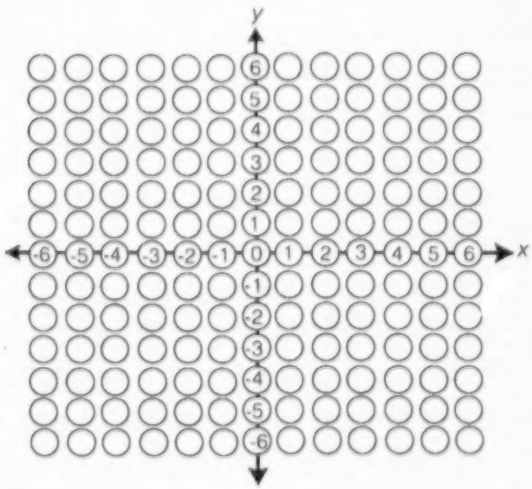
4. A line passes through two points with the coordinates (–2,1) and (4,5). What is the slope of this line?

   Mark your answer on the grid below.



5. A point has an *x*-coordinate of –4 and a *y*-coordinate of 2. What is the location of the point on the coordinate grid?

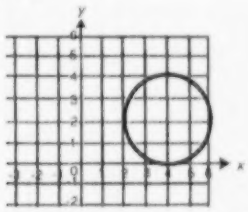
   Mark your answer on the coordinate plane grid below.



Part II: You may not use a calculator. Refer to the formulas on the back cover as needed.

For questions 6–8, choose the one best answer. For questions 9 and 10, fill in the grid.

6. The coordinate grid below shows the graph of a circle. What point is located at the center of the circle?

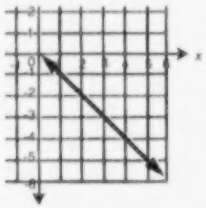


(1) (3,2)
(2) (5,2)
(3) (2,4)
(4) (4,2)
(5) (4,3)

7. Point A at (–1,1) and point B at (1,3) lie on the same line. Which of the following equations is the equation of the line?

(1) $y = 3x$
(2) $y = 2x$
(3) $y = 2x + 1$
(4) $y = 2x + 2$
(5) $y = x + 2$

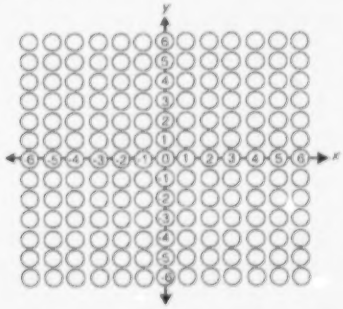
8. Which equation of a line is graphed below?



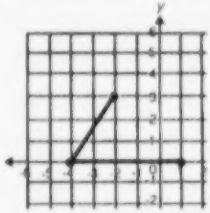
(1) $y = -x$
(2) $y = x - 1$
(3) $y = x + 1$
(4) $y = x - 3$
(5) $y = 1 - x$

9. A point has an x-coordinate of 0 and a y-coordinate of –4. What is the location of the point on the coordinate grid?

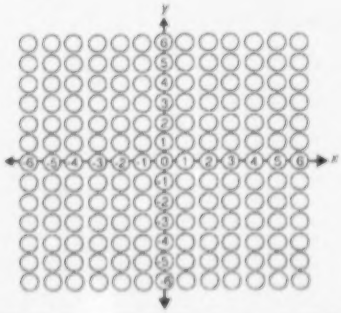
Mark your answer on the coordinate plane grid below.



10. The coordinate grid below shows the location of three vertices of a parallelogram. At what point is the fourth vertex?



Mark your answer on the coordinate plane grid below.



Evaluation and Action Plan

Check your answers. Then evaluate your results and make a plan.

Results:	I need to work more on:
☐ Five or fewer correct • *Need to study more*	☐ Points on coordinate grids (Questions 5, 6, 9,10)
☐ Six to seven correct • *Need to review*	☐ Points on a line (Questions 1, 7, 8)
☐ Eight to ten correct • *Ready to move on*	☐ Slope of line (Questions 2, 4)
	☐ Distance on coordinate grids (Question 3)

Practice GED Test

Part I: You may use a calculator. Refer to the formulas on the back cover as needed.

For questions 1 through 9, choose the one best answer. Fill in the grid for questions 10 through 12.

1. What is the value of the expression below when $x = -9$ and $y = 6$?

$$\frac{x^2}{x + y}$$

(1) 81
(2) 27
(3) 6
(4) –27
(5) –81

2. Guy has a total of nine $20 bills and $5 bills. If the total value of the bills is $105, how many bills are $5 bills?

(1) 3
(2) 4
(3) 5
(4) 6
(5) 7

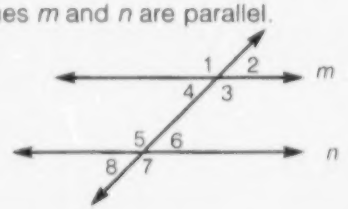
3. What is the value of the following expression when $x = -7$ and $y = 13$?

$$\sqrt{x^2 - y} + xy$$

(1) 97
(2) 91
(3) 12
(4) –85
(5) –91

Questions 4 and 5 refer to the following figure.

Lines m and n are parallel.



4. If the measure of $\angle 2$ is 45°, what is the measure of $\angle 3$?

(1) 315°
(2) 180°
(3) 135°
(4) 65°
(5) 45°

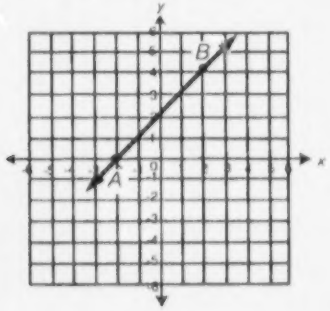
5. What is the measure of $\angle 8$?

(1) 315°
(2) 180°
(3) 135°
(4) 65°
(5) 45°

6. Which ordered pair is a solution of the equation $y = 3x + 5$?

(1) (–2,–1)
(2) (–1,–2)
(3) (0,3)
(4) (1,–2)
(5) (2,6)

7. What is the slope of line *AB*?



(1) 4
(2) 1
(3) $-\frac{1}{4}$
(4) −1
(5) −4

8. A map scale shows that 1 inch on the map equals 250 miles. If the actual distance between 2 cities is 1125 miles, how far apart on the map should the cities be?

(1) 0.5
(2) 1.5
(3) 2.5
(4) 4.5
(5) 5.0

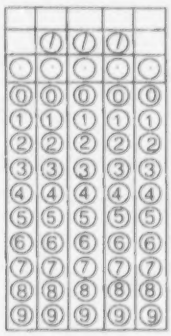
9. Point *R* is located at (3,0). Point *S* is located at (0,−4). What is the distance between points *R* and *S*?

(1) 3
(2) 4
(3) 5
(4) 9
(5) 25

10. What is the value of the expression below when $r = 4$, $s = 5$, and $t = -12$?

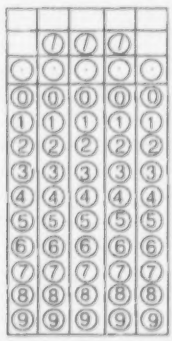
$$t^2 - rst$$

Mark your answer on the grid below.



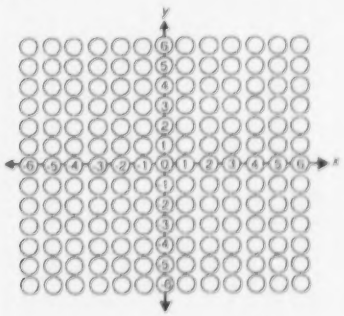
11. A square has an area of 196 square inches. What is the length of one side of the square in inches?

Mark your answer on the grid below.



12. A point has an *x*-coordinate of 5 and a *y*-coordinate of 0. What is the location of the point on the coordinate grid?

Mark your answer on the coordinate plane grid below.



Part II: You may not use a calculator. Refer to the formulas on the back cover as needed.

For questions 13 through 20, choose the one best answer. Fill in the grid for questions 21 and 22.

13. The sum of three consecutive even numbers is 96. What is the largest of these numbers?

    (1) 30
    (2) 32
    (3) 34
    (4) 36
    (5) Not enough information is given.

14. A tree casts a shadow 75 feet in length. At the same time, a 4-foot fence post casts a shadow 10 feet in length. How many feet tall is the tree?

    (1) 14
    (2) 30
    (3) 45
    (4) 65
    (5) 187.5

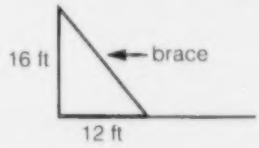
15. Eric, Walter, and Carla went on a bike ride. Carla rode twice as far as Walter, and Eric rode 5 miles farther than Carla. How many miles did Eric ride?

    (1) 10
    (2) 20
    (3) 25
    (4) 30
    (5) Not enough information is given.

16. Teresa and Janet both sold boxes of cookies to raise money for their club. Teresa sold three times as many boxes as Janet. If they sold a total of 80 boxes, how many boxes of cookies did Teresa sell?

    (1) 10
    (2) 20
    (3) 40
    (4) 60
    (5) Not enough information is given.

17. Which of the following expressions could be used to find how many feet long the brace is?

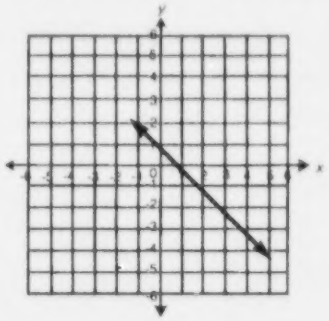


    (1) $\sqrt{16^2 + 12^2}$
    (2) $\sqrt{12 + 16}$
    (3) $\sqrt{16^2 - 12^2}$
    (4) $16^2 - 12^2$
    (5) $12^2 + 16^2$

18. Point *A* at (–1,–3) and point B at (2,6) lie on the same line. Which of the following is the equation of the line?

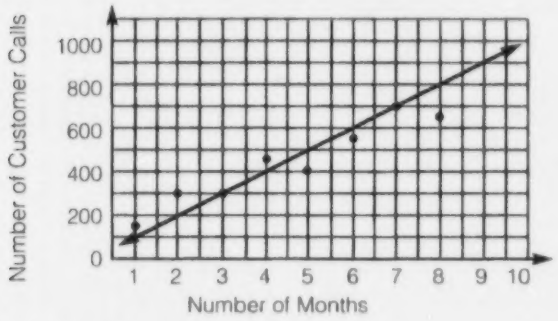
    (1) $y = 3x$
    (2) $y = 2x$
    (3) $y = 2x + 1$
    (4) $y = 2x + 2$
    (5) $y = x + 2$

19. Which equation of a line is graphed below?



    (1) $y = -x$
    (2) $y = x - 1$
    (3) $y = x + 1$
    (4) $y = x - 3$
    (5) $y = 1 - x$

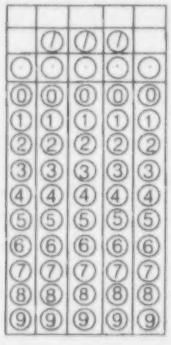
20. The graph below shows the number of customer calls the Info Hotline got during its first 8 months of operation. Using the line of best fit that is graphed below, what is a reasonable prediction for the number of calls the hotline will receive in month 9?



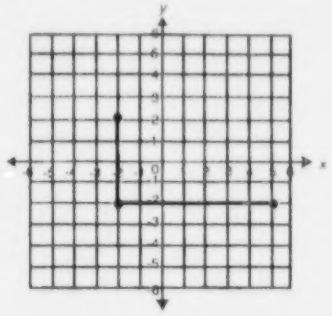
(1) 500
(2) 700
(3) 900
(4) 1100
(5) 1300

21. Luc is 8 years older than Kate. In 10 years, the sum of their ages will be 88. How old is Luc now?

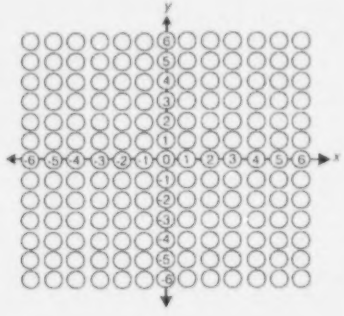
Mark your answer on the grid.



22. The coordinate grid below shows the location of three vertices of a rectangle. At what point is the fourth vertex?



Mark your answer on the coordinate plane grid below.



PRACTICE GED TEST EVALUATION AND STUDY PLAN

Check your answers. Fill in the results in the chart and make an action plan.

Questions	Strategy	Pages	Number Correct/Total
1, 2, 3, 8, 10, 13, 15, 16, 21	Algebra Problem Solving	2–19	_____/8
4, 5, 11, 14, 17	Angles, Formulas, and Similar Figures	12–23	_____/6
12, 20, 22	Coordinate Grids	26–27	_____/3
6, 18, 19	Equation of a Line	28–29	_____/3
7, 9	Slope and Distance	30–33	_____/2
			Total: _____/22

I need to work on:
- ☐ Algebra Problem Solving
- ☐ Angles, Formulas, and Similar Figures
- ☐ Coordinate Grids
- ☐ Equation of a Line
- ☐ Slope and Distance

Answer Key

STRATEGY 1: USE TABLES TO SOLVE ALGEBRA WORD PROBLEMS (page 3)

1. **(2) 20**

	David's Age	Carrie's Age.
Now	x	$3x$
In 5 years	$x + 5$	$3x + 5$

Write an equation that represents Carrie's age in five years as equal to twice David's age in five years.
$3x + 5 = 2(x + 5)$
$3x + 5 = 2x + 10$
$x = 5$
Carrie's age in 5 years: $3x + 5 = 3(5) + 5 = 20$.

2. **(3) 59**

1st Number	2nd Number	3rd Number	4th Number
x	$x + 1$	$x + 2$	$x + 3$

$x + (x + 1) + (x + 2) + (x + 3) = 230$
$4x + 6 = 230$
$4x = 224$
$x = 56$
The largest number: $x + 3 = 56 + 3 = 59$.

3. **(4) $880**

Alex	Omar	Donna
x	$x + 200$	$2(x + 200)$

$2(x + 200) + x + 200 + x = 3320$
$2x + 400 + x + 200 + x = 3320$
$4x + 600 = 3320$
$4x = 2720$
$x = 680$
Omar earns $x + 200 = 680 + 200 = \$880$.

4. **(4) 225**

	Children	Adults
Number of tickets	x	$3x$
Prices	$4	$6

$x + 3x = 300$
$4x = 300$
$x = 75$
The number of adult tickets is $3x = 3 \times 75 = 225$ tickets. You do not need to use the prices to answer the question.

5. **(2) 2**

	First Part	Second Part
Time	x	$6 - x$
Rate × Time	$70x$	$60(6 - x)$

Let x = the number of hours at 70 mph and $6 - x$ = number of hours at 60 mph. Multiply each time by the rate. The sum of these amounts is the total distance:
$70x + 60(6 - x) = 380$
$70x + 360 - 60x = 380$
$10x + 360 = 380$
$10x = 20$
$x = 2$

6. **(2) 20**

Bill	Panita	Evan
x	$6 + x$	$2(6 + x)$

Let Bill's age = x, Panita's age = $6 + x$, and Evan's age = $2(6 + x)$.
$x + (6 + x) + 2(6 + x) = 74$
$4x + 18 = 74$
$4x = 56$
$x = 14$
Panita's age: $6 + x = 6 + 14 = 20$

STRATEGY 2: USE THE CALCULATOR TO SOLVE ALGEBRA PROBLEMS (page 5)

You may have used your calculator for all or part of each solution. If you chose to do all or some of the work with pencil and paper, the individual steps are shown.

1. Expression with numbers: $m^2n = (-16)^2 \times 8$
Answer: **(5) 2048**
Calculator: 16 [+/-] [x^2] [×] 8 [=] [2048]
Solution: $(-16)^2 \times 8 = 256 \times 8 = 2048$

2. Expression with numbers: $5r - 3st = 5 \times 25 - 3 \times 10 \times 4$
Answer: **(1) 5**
Calculator: 5 [×] 25 [−] 3 [×] 10 [×] 4 [=] [5]
Solution: $(5 \times 25) - (3 \times 10 \times 4) = 125 - 120 = 5$

3. Expression with numbers: $x^2 + (x + 10) = (-4)^2 + (-4 + 10)$
Answer: **(2) 22**
Calculator: 4 [+/-] [x^2] [+] 4 [+/-] [+] 10 [=] [22]
Solution: $(-4)^2 + (-4 + 10) = 16 + 6 = 22$

4. **(5) 4**
Calculator: 8 [×] 1 [+/-] [×] 2 [+/-] [÷] 2 [+/-] [x^2] [=] [4]
Solution:
$$\frac{8xy}{y^2} = \frac{8 \times -1 \times -2}{(-2)^2} = \frac{16}{4} = 4$$

5. **(4) 268**
Calculator: 3 [×] 2 [x^2] [+] 4 [×] 4 [x^y] 3 [=] [268]
Solution: $3a^2 + 4b^3 = (3 \times 2^2) + (4 \times 4^3) =$
$(3 \times 4) + (4 \times 64) = 12 + 256 = 268$

6. **(5) 5**
Calculator: [(---] 16 [+] 9 [---)] [Shift] [x^2] [5]
Solution: $\sqrt{x+y} = \sqrt{16+9} = \sqrt{25} = 5$

7. **(5) 20**
Calculator: [(---] 2 [×] 3 [+] 5 [---)] [+] 3 [x^2] [=] [20]
Solution: $(2p + 5) + p^2 = (2 \times 3 + 5) + 3^2 = 11 + 9 = 20$

STRATEGY 3: WORK BACKWARDS TO SOLVE PROBLEMS (page 7)

1. Work backwards: Multiply each answer choice by $5. Test to see which result could be subtracted from $35 to allow for 5 bills.
Answer: **(3) 3** Three $5 bills is $15. $35 − $15 = $20. $20 divided by $10 is equal to two bills. Three bills plus two bills is five bills.

2. Work backwards: Subtract each answer choice from 96. Then subtract 12. If the result equals the answer choice, you have the right answer.
Answer: **(2) 42** 96 − 42 −12 = 42.

3. Work backwards: Think of the two odd numbers that come before each answer choice. Add all three odd numbers and see whether the sum is 57.
Answer: **(4) 21** 17 + 19 + 21 = 57

4. **(1) 9** If Seth is 9, then Stacey is 3 times 9, which equals 27. 27 – 9 = 18
5. **(3) 4** Try each of the answer choices. Only 4 × $12 + 4 × 6 equals $72, so Maria bought 4 gliders.
6. **(2) $219** Try each of the answer choices: $219 + $50 = $269, and $269 + $219 = $488.

Strategy 4: Set Up Expressions, Equations, and Functions (page 9)

1. Let x = the first day's distance.
   (5) $2(2x - 100)$
   x = 1st day's distance
   $2x - 100$ = 2nd day's distance
   $2(2x - 100)$ = 3rd day's distance
2. Let n = number of uses.
   (2) $A = 30 + 12(5) + 2n$
   annual fee: 30
   total locker fees: 12(5)
   fee per swim: $2n$
   Add the terms: $A = 30 + 12(5) + 2n$
3. Let p = Rita's weekly pay.
   (1) $\frac{1}{2}p + 0.5p + 40 = 520$ The answer choices use 0.5 for $\frac{1}{2}$. If Rita's pay is p, then Bill's pay is $0.5p + 40$. Together they equal $520.
4. **(4) $F = 6 + 0.10(n - 10)$** The monthly fee is $6, and the fee for checks is $0.10(n - 10)$. You must subtract the ten free checks from the number written (n). The sum of these expressions is the total bank fee (F).
5. **(3) $4x + 5 = 3(x + 5) - 6$** Samuel's age now is x, and Maggie's is $4x$. In five years, Samuel will be $x + 5$, and Maggie will be $4x + 5$. At that time, Maggie's age will equal 6 less than 3 times Samuel's age: $4x + 5 = 3(x + 5) - 6$.
6. **(2) $-2(n - 5)$** The difference between n and 5 is $n - 5$. The product of –2 and the difference is written $-2(n - 5)$.

GED Practice 1 (pages 10–11)

Part I

1. **(5) –91** Substitute the values in the expression.
   $2(-4)^2(-3) + \sqrt{(-4)^2 + (-3)^2} =$
   $2(16)(-3) + \sqrt{16 + 9} = -96 + \sqrt{25} = -96 + 5 = -91$
2. **(4) 64** Substitute the values and evaluate.
   $4^2 + 6(2^3) = 16 + 6(8) = 16 + 48 = 64$
3. **(1) $306.25** Let x = amount Ava sold and $3x$ = amount John sold. $x + 3x = \$1225$, and $4x = \$1225$, and $x = \$306.25$, which equals the amount Ava sold.
4. **(3) 5** After substituting the values, evaluate above and below the fraction bar first. Then divide. $\frac{xy}{y^2} = \frac{-25(-5)}{(-5)^2} = \frac{125}{25} = 5$
5. **(2) 23** Work backwards from the answer choices. Starting with option (1), if 21 were the smallest of three consecutive odd numbers, the sum would be 21 + 23 + 25 = 69. This is incorrect. Using option (2): 23 + 25 + 27 = 75. This is the correct option.
6. **(1) –1200** Substitute the values.
   $m^2n = (-20)^2(-3) = 400(-3) = -1200$
7. **(2) 2** Work backwards, using the answer choices. If option (1) were true, Angela would have 1 nickel and 6 dimes, which equals $0.65. Option (1) is incorrect. Using option (2), 2 nickels and 5 dimes would total $0.10 + $0.50 = $0.60. Option (2) is correct.
8. **40** Substitute the values, and evaluate the expression.
   $5s - 3rt = 5(20) - 3(5)(4) = 100 - 60 = 40$

Part II

9. **(3) 48** You could create a table.

x	$x + 2$	$x + 4$
44	46	48

   $x + x + 2 + x + 4 = 138$
   $3x + 6 = 138$
   $3x = 132$
   $x = 44$
   Fill in the table. The question asks for the largest of the numbers: $x + 4 = 48$.
10. **(3) $3x + (x - 10)$** Let x = the distance to the first delivery stop. The distance to the second stop is $2x$, and the distance to the third stop is $x - 10$. Add these expressions to find the distance in miles to the first three delivery stops: $x + 2x + x - 10 = 3x + (x - 10)$, which is shown in option (3).
11. **(5) $450** You could use a table to solve the problem. Let x = the amount Michael sold.

Michael	Amy	Raul
x	$x + \$50$	$3(x + \$50)$

    Set up an equation and solve for x.
    $x + x + \$50 + 3(x + \$50) = \$700$
    $2x + \$50 + 3x + \$150 = \$700$
    $5x + \$200 = \$700$
    $5x = \$500$
    $x = \$100$
    The question asks how many dollars worth of tickets Raul sold. Substitute the value for x in $3(x + \$50)$.
    $3(\$100 + \$50) = 3(\$150) = \$450$
12. **(5) Not enough information is given.** You would need to know either how many children paid to skate or how much of the total amount was due to children's admissions.
13. **(3) 900 – (0.75p + 25)** Let p = Rachel's pay. Marie's pay = $0.75p + 25$. The combined amounts equal 900. Subtract Marie's pay from 900 to find Rachel's pay.
14. **19** Use a table to solve the problem. Let x = Lilia's age and $x + 7$ = Richard's age.

Lilia's age in 10 yr	Richard's age in 10 yr
$x + 10$	$x + 7 + 10$

    Set up an equation using the sum of their ages in 10 years.
    $x + 10 + x + 7 + 10 = 51$
    $2x + 27 = 51$
    $2x = 24$
    $x = 12$
    The question asks how old Richard is now. Substitute the value for x in $x + 7$. 12 + 7 = 19

Strategy 5: Explore Angle Relationships (page 13)

1. Explain: Vertical angles are equal.
   Answer: **(4) 106°**
2. Explain: Adjacent angles = 180°; angle 5 measures 74° (180° – 106° = 74°). The sum of the angles of a four-sided figure is 360°.
   Answer: **(3) 93°** 360° – 106° – 74° – 87° = 93°
3. Explain: The sum of the angles of a triangle is 180°.
   Answer: **(2) 66°** 180° – 90° – 24° = 66°
4. **(3) 30°** Let $\angle D = x$. Then $\angle A = 2x$, $\angle B = 4x$, and $\angle C = 5x$.
   $x + 2x + 4x + 5x = 360°$
   $12x = 360°$
   $x = 30°$
5. **(2) 63°** Vertical angles have equal measures.

6. **(5) Not enough information is given.** Nothing indicates that lines b and c are parallel. If b and c were parallel, you could find the measures of all angles.

Strategy 6: Use the Formulas Page with Geometry Problems (page 15)

1. Formula: Perimeter = 4 × side
   Answer: **(1) 22**
   Let s = length of side.
   $88 = 4 \times s$
   $s = 22$
2. Formula: Volume = $\pi \times \text{radius}^2 \times \text{height}$
   Answer: **(2) 96**
   Let h = height.
   $1205.76 = 3.14 \times 2^2 \times h$ (If diameter is 4, then radius is 2.)
   $1205.76 = 12.56h$
   $h = 96$
3. Formula: Area = $\pi \times \text{radius}^2$
   Answer: **(4) 14**
   Let r = radius.
   $153.86 = 3.14 \times r^2$
   $49 = r^2$
   $r = 7$ Since the diameter is twice the radius, the diameter is $2 \times 7 = 14$.
4. **(2) 54**
   Since the perimeter is the sum of the lengths of all sides of the figure, subtract the known lengths from the perimeter.
   $384 - 36 - 84 - 108 - 30 - 72 = 54$
5. **(2) 16** Volume = length × width × height.
   Let h = height.
   $9216 = 32 \times 18 \times h$
   $9216 = 576h$
   $h = 16$
6. **(3) 6** Area = base × height. Let h = height.
   $90 = 15h$
   $h = 6$

Strategy 7: Use the Calculator with the Formulas Page (page 17)

1. Formula: Perimeter = $\text{side}_1 + \text{side}_2 + \text{side}_3$
   Answer: **(2) 25**
   Solution: Let s = side. All sides are equal.
   $75 = 3s$
   $s = 25$
   Calculator: 75 ÷ 3 = 25.
2. Formula: Volume = $\frac{1}{3} \times (\text{base edge})^2 \times \text{height}$
   Answer: **(3) 16**
   Solution: Let b = base edge.
   $768 = \frac{1}{3} \times b^2 \times 9$
   $768 = 3b^2$
   $256 = b^2$
   $b = 16$
   Calculator: 1 a b/c 3 × 9 = 3.
   768 ÷ 3 = 256
   256 Shift x^2 16.
3. Formula: Area = $\frac{1}{2} \times (\text{base}_1 + \text{base}_2) \times \text{height}$
   Answer: **(3) 20**
   Solution: Let h = height.
   $600 = \frac{1}{2} \times (24 + 36) \times h$
   $600 = \frac{1}{2} \times 60 \times h$
   $600 = 30h$
   $h = 20$
   Calculator: 24 + 36 = 60.
   60 × 1 a b/c 2 = 30
   600 ÷ 30 = 20
4. **(4) 10** Use the formula:
   Volume = $\frac{1}{3} \times \pi \times \text{radius}^2 \times \text{height}$. Let r = radius.
   $1256 = \frac{1}{3} \times 3.14 \times r^2 \times 12$
   $1256 = 12.56r^2$
   $100 = r^2$
   $r = 10$
   Calculator: 1 a b/c 3 × 3.14 × 12 = 12.56
   1256 ÷ 12.56 = 100
   100 Shift x^2 10.
5. **(2) 3** Since the path through the circle is the diameter, use the formula: Circumference = $\pi \times$ diameter.
   Solution: Let d = diameter.
   $9.42 = 3.14 \times d$
   $d = 3$
   Calculator: 9.42 ÷ 3.14 = 3.
6. **(1) 3** Use the formula: Area = length × width.
   Solution: Let w = width. Remember to convert feet to inches: 8 ft × 12 = 96 in.
   $3456 = 96 \times w$
   $w = 36$
   Since the width is still in inches, divide by 12 to convert to feet: $36 \div 12 = 3$.
   Calculator: 8 × 12 = 96.
   3456 ÷ 96 = 36
   36 ÷ 12 = 3.

Strategy 8: Solve Set-up Problems in Geometry (page 19)

1. Formula or Concept: The sum of the angles of a triangle is 180°.
   Answer: **(2) 180° – (50° × 2)**
   Since two of the angles measure 50°, multiply 50° by 2 and subtract from 180°.
2. Formula or Concept: Circumference = $\pi \times$ diameter
   Answer: **(4) π(9)**
   The diameter is 9, so multiply π by 9.
3. Formula or Concept: Area = $\frac{1}{2} \times$ base × height
   Answer: **(1)** $\frac{b \times 14}{2} = 224$
   Let b = base. Multiplying the base by the height and dividing by 2 is the same as $\frac{1}{2} \times$ base × height
4. **(4) 180° – 90° – 55°** Since $CDFE$ is a rectangle, $\angle ECD$ and $\angle CDF$ each equal 90°. Find the measure of $\angle CDE$ by subtracting the given measure from 90° (90° – 35° = 55°). To find $\angle CED$, use the known angles in triangle CDE. Since the measures of the angles in a triangle have a sum of 180°, subtract the known angles from 180° (180° – 90° – 55°).
5. **(1) $3w \times w = 12$** Let w = width. Since the length of BF is three times the measure of the width AB, let length = $3w$. Area = length × width, so $12 = 3w \times w$.
6. **(2) $60° + m\angle A + 90° = 180°$** Line ST is a straight angle, which measures 180°. The three angles that make up line ST have a sum of 180°.

Strategy 9: Use the Pythagorean Relationship (page 21)

1. Leg or Hypotenuse? **leg**
   Answer: **(3) 6.0**
   $7.5^2 - 4.5^2 = 36$
   $\sqrt{36} = 6$

2. Leg or Hypotenuse? **hypotenuse**
Answer: **(2) 25**
$7^2 + 24^2 = 625$
$\sqrt{625} = 25$

3. Leg or Hypotenuse? **hypotenuse**
Answer: **(4) 30**
$18^2 + 24^2 = 900$
$\sqrt{900} = 30$

4. **(1)** $\sqrt{16^2 + 12^2}$ After finding the sum of the squares of the legs, you must take the square root of the result to find the hypotenuse (x).

5. **(2) 9** Solve for the leg.
$15^2 - 12^2 = 81$
$\sqrt{81} = 9$

6. **(5) Not enough information is given.** You don't know whether you are missing the length of a leg or the hypotenuse.

Strategy 10: Use Proportion with Similar Figures (page 23)

You may have written your proportions differently, in a way that makes sense to you. That is fine—as long as your solution results in a correct answer.

1. Proportion: $\frac{7.5}{12.5} = \frac{3}{x}$
Answer: **(3) 5**
Cross multiply and divide.
$7.5x = 12.5 \times 3$
$7.5x = 37.5$
$x = 5$

2. Proportion: $\frac{48}{72} = \frac{x}{3}$
Answer: **(2) 2**
Cross multiply and divide.
$72x = 144$
$72x = 48 \times 3$
$x = 2$

3. Proportion: $\frac{4}{3} = \frac{x}{6}$
Answer: **(4) 8**
Cross multiply and divide.
$3x = 4 \times 6$
$3x = 24$
$x = 8$

4. **(3) 10**
Solve this proportion.
$\frac{3}{2} = \frac{15}{x}$
$3x = 15 \times 2$
$3x = 30$
$x = 10$

5. **(4) 36**
Solve this proportion.
$\frac{6}{12} = \frac{18}{x}$
$6x = 18 \times 12$
$6x = 216$
$x = 36$

6. **(1) 3**
Solve this proportion.
$\frac{7}{14} = \frac{x}{6}$
$14x = 7 \times 6$
$14x = 42$
$x = 3$

GED Practice 2 (pages 24–25)

Part I

1. **(2) 6** Substitute the given values for area and height to solve for the base.
$A = \frac{1}{2}bh$
$10.5 = \frac{1}{2}(b)(3.5)$
$10.5 = 1.75(b)$
$6 = b$

2. **(3) 75°** The sum of the angles of a triangle is 180°. Subtract the known angles to find the missing angle.
$180° - 60° - 45° = 75°$

3. **(2) 20** The distance from a circle's edge to its center is the radius. Since you know the distance around the circle, use the formula for circumference.
$C = \pi d$
$125.6 = 3.14d$
$\frac{125.6}{3.14} = d$
$40 = d$
The radius is half the diameter, so $r = \frac{1}{2}(40) = 20$.

4. **(4) 65°** Vertical angles are equal. Since $\angle 2$ and $\angle 4$ are vertical angles, $\angle 4 = 65°$.

5. **(3) 115°** Angles 1 and 5 and angles 3 and 7 are corresponding angles. If you can find the value of one of those angles, you know the value of the other angles.
$180° - \angle 2 = \angle 1$
$180° - 65° = \angle 1$
$115° = \angle 1 = \angle 7$

6. **7.2** Since the figures are similar, set up a proportion and solve for the missing measurement. Convert feet to inches.
$\frac{36}{60} = \frac{x}{12}$
$36 \times 12 \div 60 = 7.2$

Part II

7. **(1) 180° – (30° × 2)** Subtract the measure of the two known angles from the sum of the angles in a triangle.

8. **(2) $40° + m\angle A + 90° = 180°$** The sum of the angles in a triangle is 180. You can use that information and the two given angles to find $m\angle A$. (The figure indicates that one of the angles is a right angle.)

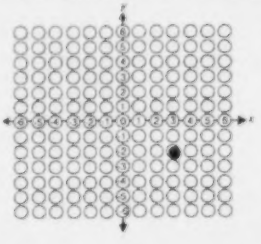
9. **(3) 25** Use proportion to find the missing value.
$\frac{x}{100} = \frac{5}{20}$
$100 \times 5 \div 20 = x$
$25 = x$

10. **(1)** $\sqrt{9^2 + 12^2}$ Use the Pythagorean relationship, since the ladder forms the hypotenuse of a right triangle.
$c^2 = a^2 + b^2$
$c = \sqrt{a^2 + b^2}$
$= \sqrt{9^2 + 12^2}$

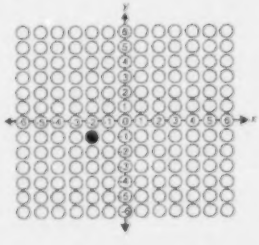
11. **15** Substitute the known values into the formula for area of a parallelogram.
$A = bh$
$375 = 25(h)$
$15 = h$

Strategy 11: Plots Points on Coordinate Grids (page 27)

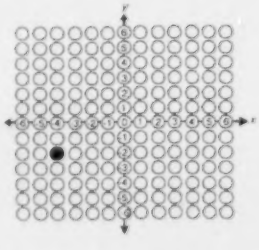
1. Coordinate pair: **(3,–2)**



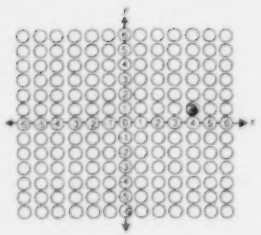
2. Coordinate pair: **(–2,–1)**
The diameter of the circle is 6 units. Start from the point where the circle touches a vertical and horizontal line on the grid. Count in 3 units from the side and top or bottom to find the center.



3. Coordinate pair: **(–4,–2)**



4. Coordinate pair: **(4,1)**
Opposite sides of a parallelogram are equal, so the missing side must be 4 units long. Four units to the right of point (0,1) is (4,1).



STRATEGY 12: FIND POINTS ON A LINE (page 29)

1.

x	0	1	2	3
y	1	0	–1	–2

(5) $y = 1 - x$
Use the coordinates on the graph in the table of values. Substitute the ordered pairs into the equations to find the one that works.

2.

x	–2	1	2	4
y	–8	1	4	10

(3) (2,4)
Substitute the values listed for x in the answer choices into the given equation to make a table of values. The ordered pair (2,4) is the only one in the table that satisfies the equation.

3.

x	1	2	–2	–6
y	–2	–4	4	12

(1) (2,–4)
Substitute the values listed for x in the answer choices into the given equation to make a table of values. The ordered pair (2,–4) is the only one in the table that satisfies the equation.

4. **(2) 160** Find 8 hours on the x-axis. Move directly up until you intersect the line of best fit. Follow directly across to the y-axis. The value on the scale is 160.
5. **(3) 3.5** Find 70 on the y-axis. Move to the right until you intersect the line of best fit. The point of intersection occurs about halfway between 3 and 4 hours on the x-axis.

STRATEGY 13: FIND SLOPE ON A COORDINATE GRID (page 31)

1. Ratio: $-\frac{3}{1}$
Answer: **(5) –3** Line CD has a rise of 3 units and a run of 1 unit. Since the line goes down, the slope is negative.
2. Ratio: $\frac{0}{3}$
Answer: **(1) 0** Look at points A and B. There is no rise in the line. The run from point A to point B is 3. All horizontal lines have a slope of 0.
3. Ratio: $-\frac{3}{4}$
Answer: **(3)** $-\frac{3}{4}$ To connect points H and I, go down 3 units and then go to the right 4 units. Since the line slopes downward from left to right, the slope is negative.
4. **(1) 5** Use the slope formula:
$\frac{y_2 - y_1}{x_2 - x_1}$
$\frac{-4-1}{4-5} = \frac{-5}{-1} = 5$
5. **(2)** $-\frac{1}{4}$ Line E has a rise of 1 and a run of 4. Since the line slopes downward from left to right, the slope is negative: $-\frac{1}{4}$.
6. **(4) *D*** Only lines D and B have a positive slope. Line D has a rise of 2 and a run of 3.

STRATEGY 14: FIND THE DISTANCE BETWEEN POINTS (page 33)

1. Expression or Equation: $\sqrt{(3-8)^2 + (-2-4)^2}$
Answer: **(3) 8**
Simplify the expression: $\sqrt{25+36} = \sqrt{61} \approx 8$
because $\sqrt{61}$ is close to $\sqrt{64}$, which equals 8.
2. Expression or Equation: $\sqrt{(-1--2)^2 + (0-3)^2}$
Answer: **(1) 3** Use the coordinates of the vertices of side KL with the distance formula. Simplify the expression: $\sqrt{1+9} = \sqrt{10} \approx 3$ because $\sqrt{10}$ is close to $\sqrt{9}$, which equals 3.
3. Expression or Equation: $2^2 + 3^2 = c^2$
Answer: **(4) 3.6** Draw a right triangle with side LM as the hypotenuse, and then use the Pythagorean relationship to write the equation above. Solve the equation: $4 + 9 = c^2$
$c = \sqrt{13} \approx 3.6$
4. **(3) 14**
Use the distance formula to simplify the expression:
$\sqrt{(-3-5)^2 + (-4-7)^2} = \sqrt{64+121} = \sqrt{185} \approx 13.6 \approx 14$
5. **(5) 18** Use the Pythagorean relationship to find the length of side UV: $\sqrt{3^2 + 4^2} = 25$, and $\sqrt{25} = 5$. Since UV and TV are congruent (equal), you now know both lengths. Count the number of units to find the length of TV: 8. Add the three lengths: 5 + 5 + 8 = 18.
6. **(2) 7** Make a right triangle, and use the Pythagorean relationship to write an equation to find the length of the hypotenuse, which is side RS.
$4^2 + 6^2 = c^2$
$16 + 36 = c^2$
$c^2 = 52$
$c \approx 7$

GED PRACTICE 3 (pages 34–35)

Part I

1. **(3) (0,–3)** Substitute the values for x and y, and check to see if the equation is true.
$-3 = 5(0) - 3$
$-3 = 0 - 3$
$-3 = -3$
2. **(4) –1** Either count the units of rise over run, or use the formula for finding the slope of a line.
$\frac{y_2 - y_1}{x_2 - x_1} = \frac{(-3-2)}{(5-0)} = \frac{-5}{5} = -1$
3. **(2) 4** Use the formula for distance between points.
$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} =$
$\sqrt{(-4-0)^2 + (-3--1)} =$
$\sqrt{(-4)^2 + (-2)^2} =$
$\sqrt{16 + 4} =$
$\sqrt{20} = 4.472$ which rounds down to 4
4. $\frac{2}{3}$ Use the formula for finding the slope of a line.
$\frac{(y_2 - y_1)}{(x_2 - x_1)} = \frac{(1-5)}{(-2-4)} = \frac{-4}{-6} = \frac{2}{3}$
5. **(–4,2)** You should have plotted a point that is 4 units to the left on the x-axis (horizontal) and 2 units up on the y-axis (vertical).

Part II

6. **(4) (4,2)** The longest distance across a circle is from one edge of the circle to the other edge through the center. This is the diameter. The center of the circle

would be located at half this distance. The center of this circle is at (4,2).

7. **(5) $y = x + 2$** Substitute the given points in the answer choices to see which equation is true for both points.
   $y = x + 2$ $\quad\quad$ $y = x + 2$
   $1 = -1 + 2$ $\quad\quad$ $3 = 1 + 2$
   $1 = 1$ $\quad\quad$ $3 = 3$
8. **(1) $y = -x$** Pick at least two points that the line passes through. Substitute the coordinates of the points into the equations in the answer choices to find which equation is true for at least two points on the line.
9. **(0,–4)** Since the *x*-coordinate is 0, you should have plotted a point located at –4 on the *y*-axis.
10. **(3,3)** A parallelogram has pairs of opposite sides that are parallel and equal in length. To complete this parallelogram, plot a point that makes a side equal in length to the base of the figure (count the units: 5). The point should also have the same *y*-coordinate as (–2,3). Five units to the right of (–2,3) is (3,3).

PRACTICE GED TEST (pages 36–39)

Part I

1. **(4) –27** Substitute the values and evaluate.
   $$\frac{x^2}{x+y} = \frac{(-9)^2}{-9+6} = \frac{81}{-3} = -27$$
2. **(3) 5** One strategy is to work backwards from the answer choices. Option (1) would result in three $5 bills ($15). That would leave six $20 bills ($120), which would total $135. Option (2) would be four $5 bills ($20) and five $20 bills ($100) for a total of $120. Option (3) would be five $5 bills ($25) and four $20 bills ($80) for a total of $105.
3. **(4) –85** Evaluate the expressions using the given values.
   $\sqrt{x^2 - y} + xy = \sqrt{(-7)^2 - 13} + (-7)(13) =$
   $\sqrt{49 - 13} - 91 = \sqrt{36} - 91 = 6 - 91 = -85$
4. **(3) 135°** Angles 2 and 3 form a straight line, which equals 180°. Subtract the measure of ∠2 from 180° to find the measure of ∠3. 180° – 45° = 135°
5. **(5) 45°** Since angles 2 and 6 are corresponding angles, and angles 6 and 8 are vertical angles, $m\angle 2 = m\angle 6 = m\angle 8 = 45$.
6. **(1) (–2,–1)** Substitute the values of the ordered pair in the equation.
   $y = 3x + 5$
   $-1 = 3(-2) + 5$
   $-1 = -6 + 5$
   $-1 = -1$
   Option (1) makes the equation true.
7. **(2) 1** Use the slope formula.
   $$\frac{(y_2 - y_1)}{(x_2 - x_1)} = \frac{0-4}{-2-2} = \frac{-4}{-4} = 1$$
8. **(4) 4.5** Set up a proportion and solve.
   1 inch/250 miles = *x* inches/1125 miles
   $1 \times 1125 \div 250 = 1125 \div 250 = 4.5$
9. **(3) 5** Use whichever method works best for you. Using the distance between points formula:
   $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} =$
   $\sqrt{(0 - 3)^2 + (-4 - 0)^2} =$
   $\sqrt{(-3)^2 + (-4)^2} =$
   $4 + 16 = \sqrt{25} = 5$
10. **384** Evaluate the expression.
    $t^2 - rst = (-12)^2 - (4)(5)(-12) = 144 + 240 = 384$
11. **14** Use the formula for area of a square, and fill in the known values.
    $A = s^2$
    $196 = s^2$
    $\sqrt{196} = s$
    $14 = s$
12. **(5,0)** Plot the point on the coordinate grid. First locate the *x*-coordinate (5), which is 5 units to the right of the origin. Since the *y*-coordinate is 0, the point lies on the *x*-axis at 5.

Part II

13. **(3) 34** You could use a table to organize the information.

x	$x + 2$	$x + 4$
30	32	34

    $x + x + 2 + x + 4 = 96$
    $3x + 6 = 96$
    $3x = 90$
    $x = 30$; Fill in the chart using this information. The largest of the values is $x + 4 = 34$.
14. **(2) 30** Since these are similar figures, you can use proportion to solve for the missing length.
    height/ shadow $\quad\quad$ x/75 ft = 4 ft/10 ft
    $4 \times 75 \div 10 = 300 \div 10 = 30$
15. **(5) Not enough information is given.** You need to know either the combined distance that all three people rode or the number of miles one of the people rode.
16. **(4) 60** Let *x* = the number of boxes Janet sold. Let 3x = the number of boxes Teresa sold.
    $x + 3x = 80$
    $4x = 80$
    $x = 20$ and $3x = 3(20) = 60$
17. **(1)** $\sqrt{16^2 + 12^2}$ Since the brace forms the hypotenuse of a right triangle with the two sides, you can use the Pythagorean relationship to find the length of the brace. The brace would be represented by *c* in the formula $c^2 = a^2 + b^2$, and $c = \sqrt{a^2 + b^2}$.
18. **(1) $y = 3x$** Substitute the coordinates into the equations in the answer choices until you find the equation that both coordinates make true. For option (1),
    $y = 3x$ $\quad\quad$ $y = 3x$
    $-3 = 3(-1)$ $\quad\quad$ $6 = 3(2)$
    $-3 = -3$ $\quad\quad$ $6 = 6$
19. **(5) $y = 1 - x$** Choose at least two points on the line, and plug the coordinates into the equations in the answer choices. At least two points must make the equation true for it to be the equation of a line. For option (5),
    $y = 1 - x$ $\quad\quad$ $y = 1 - x$
    $1 = 1 - 0$ $\quad\quad$ $0 = 1 - 1$
    $1 = 1$ $\quad\quad$ $0 = 0$
20. **(3) 900** Find 9 on the *x*-axis. Move directly up until you intersect the line of best fit. Follow directly across to the *y*-axis. The value on the scale is 900.
21. **38** Set up a table to organize the information.

	Now	In 10 years
Kate	x	$x + 10$
Luc	$x + 8$	$x + 8 + 10$

    Write an equation and solve.
    $x + 10 + x + 8 + 10 = 88$
    $2x + 28 = 88$
    $2x = 60$
    $x = 30$
    Find out how old Luc is now: $x + 8 = 30 + 8 = 38$.
22. **(5,2)** A rectangle has equal opposite sides. The fourth vertex needs to be directly across from coordinates (–2,2) and directly up from coordinates (5,–2).

GED Formulas Page

AREA OF A:	
square	Area = side^2
rectangle	Area = length × width
parallelogram	Area = base × height
triangle	Area = $\frac{1}{2}$ × base × height
trapezoid	Area = $\frac{1}{2}$ × (base$_1$ + base$_2$) × height
circle	Area = π × radius^2; π is approximately equal to 3.14
PERIMETER OF A:	
square	Perimeter = 4 × side
rectangle	Perimeter = 2 × length + 2 × width
triangle	Perimeter = side$_1$ + side$_2$ + side$_3$
CIRCUMFERENCE OF A CIRCLE	Circumference = π × diameter; π is approximately equal to 3.14
VOLUME OF A:	
cube	Volume = edge^3
rectangular container	Volume = length × width × height
square pyramid	Volume = $\frac{1}{3}$ × (base edge)^2 × height
cylinder	Volume = π × radius^2 × height; π is approximately equal to 3.14
cone	Volume = $\frac{1}{3}$ × π × radius^2 × height; π is approximately equal to 3.14
COORDINATE GEOMETRY	distance between points = $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$; (x_1, y_1) and (x_2, y_2) are two points in a plane. slope of a line = $\frac{y_2 - y_1}{x_2 - x_1}$; (x_1, y_1) and (x_2, y_2) are two points on a line.
PYTHAGOREAN RELATIONSHIP	$a^2 + b^2 = c^2$; a and b are legs and c the hypotenuse of a right triangle.
MEASURES OF CENTRAL TENDENCY	**mean** = $\frac{x_1 + x_2 + \ldots + x_n}{n}$; where x's are the values for which a mean is desired, and n is the total number of values for x. **median** = the middle value of an odd number of *ordered* scores, and halfway between the two middle values of an even number of *ordered* scores.
SIMPLE INTEREST	interest = principal × rate × time
DISTANCE	distance = rate × time
TOTAL COST	total cost = (number of units) × (price per unit)

Reprinted with permission of the GED Testing Service of the American Council on Education.

GED SCOREBOOST™ WORKBOOKS

GED Mathematics
Scientific Calculator, Grid, and Problem-Solving Strategies
Whole Numbers, Decimals, Fractions, and Percents
Measurement and Data Analysis
Algebra and Geometry

GED Writing
Essay and Multiple-Choice Strategies
Essay Writing and Organization Skills
Sentence Structure, Usage, and Mechanics

GED Thinking Skills
Strategies Across the Content Areas
Critical Thinking for Reading, Social Studies, and Science
Graphic Skills for Social Studies and Science

ISBN 0-9717167-2-2
9 780971 716728

New Readers Press
U.S. Publishing Division of Laubach Literacy
Syracuse, New York 13210
800-448-8878
www.newreaderspress.com

TM034796

U.S. Department of Education
Office of Educational Research and Improvement (OERI)
National Library of Education (NLE)
Educational Resources Information Center (ERIC)

NOTICE

Reproduction Basis

☒ This document is covered by a signed "Reproduction Release (Blanket)" form (on file within the ERIC system), encompassing all or classes of documents from its source organization and, therefore, does not require a "Specific Document" Release form.

☐ This document is Federally-funded, or carries its own permission to reproduce, or is otherwise in the public domain and, therefore, may be reproduced by ERIC without a signed Reproduction Release form (either "Specific Document" or "Blanket").

ERIC FACILITY ACQUISITIONS MEMO

TO: Clearinghouse Staff

FR: Christine Myers, Acquisitions Librarian

EFF-089 (3/2000)

The attached document is covered by a new or recently changed Facility Blanket Arrangement.

Authorizer, First Initial, Last Name: C. Van Slyke

Level: 2B